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ABSTRACT

Research and related literature completed during 1966-1968 is reviewed in order to provide researchers, curriculum development specialists, and practitioners with an authoritative analysis. The review is limited primarily to those studies with relevance for business and office preparation in senior high schools and 2-year postsecondary schools; however, research relevant to business teacher education is also included. Entries are organized according to the following major topics: Philosophy and Objectives, Manpower Needs and Employment Preparation, Curriculum Development, Educational Programs, Instructional Materials and Devices, Learning Processes and Teaching Methods, Student Personnel Services, Facilities and Scheduling, Teacher Education, Administration and Supervision, Evaluation, and Research. A bibliography of the cited materials gives ERIC document numbers for documents available in microfiche and hard copy forms from ERIC Document Reproduction Service. The first edition, covering the period 1960-1966, is available as ED 011 566. (CH)

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review and synthesis of research in

Business and Office Education

second edition

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REVIEW AND SYNTHESIS OF RESEARCH IN BUSINESS AND OFFICE EDUCATION

Second Edition

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April 1970

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
OFFICE OF EDUCATION

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PREFACE

This *Review and Synthesis of Research in Business and Office Education, Second Edition* is one of a second generation of papers which assess the "state of the art" in vocational and technical education and related fields. It should assist in identifying substantive problems and methodological approaches for researchers and curriculum development specialists, as well as providing practitioners with a summary of research findings which have application to educational programs. In the field of vocational and technical education, the pace of research and development activities has increased considerably during the period under review. Gaps which exist for some readers are probably the result of the author's prerogative to be selective.

As one of a series of information analysis papers released by the ERIC Clearinghouse on Vocational and Technical Education, this review is intended to provide researchers, curriculum development specialists, and practitioners with an authoritative analysis of the literature in the field. Those who wish to examine primary sources of information should utilize the bibliography. Where ERIC Document numbers and ERIC Document Reproduction Service prices are cited, the documents are available in microfiche and hard copy forms.

The profession is indebted to Ray G. Price and Charles R. Hopkins for their scholarship in the preparation of this report. Recognition is also due Robert A. Schultheis, chairman of the Business Education Department at Southern Illinois University at Edwardsville, and Lawrence W. Erickson, Assistant Dean of the Graduate School of Education at the University of California at Los Angeles, for their critical review of the manuscript prior to its final revision and publication. Joel Magisos, information specialist at The Center, coordinated the publication's development.

Members of the profession are invited to offer suggestions for the improvement of the review and synthesis series and to suggest specific topics or problems for future reviews.

Robert E. Taylor
Director
The Center for Vocational and
Technical Education
ERIC Clearinghouse on
Vocational and Technical
Education

INTRODUCTION

This review was, in general, limited to work completed during the period 1966-1968. In order to identify research completed during that period, the reviewers searched the usual library sources. Another phase of the search was a survey by mail of representatives of the National Association for Business Teacher Education, state supervisors, and teacher educators.

Because of the need to include only those studies relating to the topics covered in the review, efforts were made to screen the reports by: 1) title, 2) abstract, and 3) primary source. As a result of this screening, some reports whose value was not apparent by title or by abstract may have been overlooked.

Research studies included are primarily those that are relevant to business and office preparation at senior high schools and two-year post-secondary schools. Also included are reports pertaining to business teacher education.

This report is subject to those limitations usually present in a project of this type. The review includes only those studies about which the reviewers could obtain suitable information within the time, money, and accessability limits of the project. Therefore, no claim is made that the review and synthesis is complete.

No attempt has been made to assess the quality of individual research studies. This task, because of its unmanageability, has been left to the reader.

Some readers may question the inclusion of certain items in a review and synthesis of research. It was the feeling of the reviewers, however, that certain items were of value since the authors were knowledgeable in the field of research and reflected this knowledge in their writing.

The reviewers hope that the time and effort expended in the preparation of this review will provide background information needed for future research efforts.

Ray G. Price
Charles R. Hopkins

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REVIEW AND SYNTHESIS OF RESEARCH IN BUSINESS AND OFFICE EDUCATION

Second Edition

PHILOSOPHY AND OBJECTIVES

The controversy over the distinction between a philosophy of education and a philosophy of vocational education continues. However, the sharp lines of demarcation between "vocational" and "general" education are becoming blurred. As these lines fade away, notable changes in philosophy can be observed. The trend of thinking is definitely in the direction of greater integration of vocational and general education. One urgent goal proposed by the Education Commission of the States, Ad Hoc Committee on Vocational-Technical Education (1968) was for "the placement of occupational education in the mainstream of education." Changes in philosophy are reflected in reports, based on substantial research evidence; distributed by such respected educational groups as: The American Council on Education (Venn, 1964), the National Association of Secondary School Principals (Draper, 1967), Phi Delta Kappa (1965), and the National Society for the Study of Education (1965). In addition, the Vocational Education Amendments of 1968, based upon the research evidence presented, incorporated the concept of an integrated approach to occupational education. Beaumont (1969) quoted statements which the House Committee on Education and Labor felt were worthy of serious consideration. Two of these considerations were:

"Any dichotomy between academic and vocational is outmoded. . . ."

"Vocational preparation should be used to make academic education concrete and understandable, and academic education should point up the vocational implications of all education." It seems apparent that the point of view is being generally accepted that human resource development is dependent upon all levels and all facets of education. No one group can do it alone.

Morgan and Bushnell (1967) support the nonseparation philosophy when they contend that: "The tendency in the past to separate general and vocational education has penalized both those who are college-bound and those who plan to terminate their formal education at the end of high school or junior college."

Evidence of the changing viewpoint regarding responsibilities to youth has altered the Nation's philosophy of education, especially vocational education. In 1966, Secretary of Labor Wirtz commented on these changes when he raised the question of "why the content of what children are taught should be directed by what the 'system' needs." Ray (1968) says that "We should be assuring every boy and girl the opportunity to develop to his highest potential, whatever his talents and capacities may be." In commenting about the same point, Ray (1968) concludes that: "There is increasing evidence that youth need not be pawns in the national effort to keep manpower supply and demand in a viable relation to each other."

Darcy and Powell in their discussion of *The Meaning of Manpower Education* (1968) contend that there are two dimensions to manpower

education: manpower development and economic understanding. Darcy and Powell (1969) suggest that economic understanding includes a comprehension of "how the economic system functions; the role of human resources—men and women in their capacity as workers—in the process of production and distribution; and the implications of the sometimes forgotten fact that man is more than a means of production: he is a citizen, a consumer, and most of all, a person. . ." The vast majority of men and women in our society play three different economic roles. First, they are all *Consumers* and must make choices and decisions about spending, saving, borrowing and lending. Second, they are *Citizens* and must make decisions at the ballot box about issues such as taxes, school budgets, and social security programs—and about candidates for public office. Third, they are *Workers* (or income-earners) who need to qualify for employment and earnings by acquiring occupational skills for which a demand exists in the manpower market.

Translating the effect of manpower planning on education, Ristau (1969) offers the following as representative of "new" developments. These developments represent a change in the traditional philosophy and objectives of vocational education.

1. The movement of vocational education into the mainstream of the United States educational system.
2. The discontinuance of separate vocational schools.
3. The emphasis on manipulative powers is shifting to emphasis on cognitive powers.
4. The broadened base of vocational preparation programs integrates vocational education into a comprehensive educational program at both the secondary and post-secondary levels.

General Objectives

Morgan and Bushnell (1967), in view of their expressed philosophy, contend that objectives such as the following are needed:

1. Emphasize the articulation between academic and vocational learning for the purpose of fusing the two programs. Employing vocational preparation as the principal vehicle, the inculcation of basic learning skills could be made more palatable to many students who otherwise would have difficulty seeing the value of a general education.
2. Expose the student to an understanding of the "real world" through a series of experiences which capitalize on the universal desire of youth to investigate life for themselves. Abstract, verbal principles would be acquired through nonverbal stimuli, such as seeing, feeling, manipulating, and even smelling.
3. Develop a core of generalizable skills related to a cluster of occupations rather than just to one specialized occupation.
4. Orient students to the attitudes and habits which go with successful job performance.
5. Help prospective workers understand how they fit within the economic and civic institutions of our country.

6. Make students aware that learning is life oriented and need not, indeed must not, stop with their exit from formal education.

7. Help students cope with a changing labor market through developing problem-solving abilities and career strategies which can lead to an adequate level of income and responsibility.

8. Create within the student a sense of self-reliance and awareness which leads him to seek out appropriate careers with realistic aspiration levels.

Research in the area of philosophy and objectives is needed to determine the relationship between tradition and changes; among philosophic statements, individual and group convictions, and daily practices in the schools. One research group (Frank, 1965) attempted this research and contributed these six examples of innovative approaches to vocational education:

1. Accessibility to quality vocational education programs.
2. Programs to meet the full spectrum of capabilities of youth and adults.
3. Coupling vocational and general education as integral parts of a common core within a total educational program.
4. Open-ended, continuous vocational education opportunities.
5. Early orientation to vocational education through exploratory occupational experiences in which the traditional division of education into separate subject disciplines is replaced by an educational "mix" starting in the elementary school.
6. Instructional flexibility to prepare students for adaptation to constantly changing employment patterns.

Philosophy of Business Education

For many decades the business program served one purpose almost exclusively; the vocational purpose. However, in the past 20 years the second purpose, economic understanding, has received increasing support.

Daughtrey (1965), after reviewing the professional literature in the field concluded that: "Most leaders in the field believe that business education now has a twofold philosophy." She states this twofold philosophy in this manner:

"Business education offers to every individual an opportunity to develop those skills, abilities, and understandings that will enable him to handle competently his personal business affairs; to develop an understanding of the vocational opportunities available in the broad field of business; and to assume his citizenship responsibilities through enlightened participation in and understanding and appreciation of the American enterprise system.

"It offers to the student who wishes to pursue a career in business those skills, abilities, and understandings that will enable him to enter, perform, and progress in a business occupation after graduation from high school and it provides him with the occupational intelligence to enable him to fit into and find job satisfaction in the labor force of our complex and dynamic economy."

Eyster (1966) lists three major purposes of business and economic education:

General education for all persons

I. To contribute to the attainment of the goals of *general education;*
II. To provide *basic business education* including
  a. Instruction in the performance of those business activities in which all persons engage regardless of their age, occupation or profession, and economic or social status
  b. Development of understanding of economic-business principles and concepts (American Competitive Economic System) that are essential for an effective participating, contributing citizenry and also are requisite for effective service as an efficient, informed producer in the role of employee, employer, or owner; and
III. To provide *practical job preparatory (vocational) education* for efficient and effective service in
  a. The office occupations
  b. The distributive and services occupations and
  c. The ownership, management, and operation of small individually owned and controlled business enterprise

Vocational education for persons preparing for a business career*

* Every complete vocational curriculum will also make a contribution to the attainment of the goals of general education.

Wanous (1968) submitted an evaluative form to 31 leaders in business education asking them to indicate the objective, curriculum, and course standards each believed business programs should meet. Twenty-four business leaders responded. Some of the results of the study follow.

"The majority of leaders involved in this study believed that business programs and courses should be offered to facilitate job placement and contribute to the general education of students. Programs should be organized to meet the educational needs of all the students in the school. While none of the leaders believed that programs of both academic and vocational education should be required of all students, they did believe that this standard would be a desirable one for the large majority of students in our schools who probably will not enter college or stay there long enough to become occupationally proficient."

MANPOWER NEEDS AND EMPLOYMENT PREPARATION

Manpower Needs

There seems to be a wealth of job opportunities in office occupations. One has only to look at the classified section of any large city newspaper to substantiate such a statement. There would seem to be no decrease in such opportunities in the future. The U.S. Department of Labor's *Monthly*

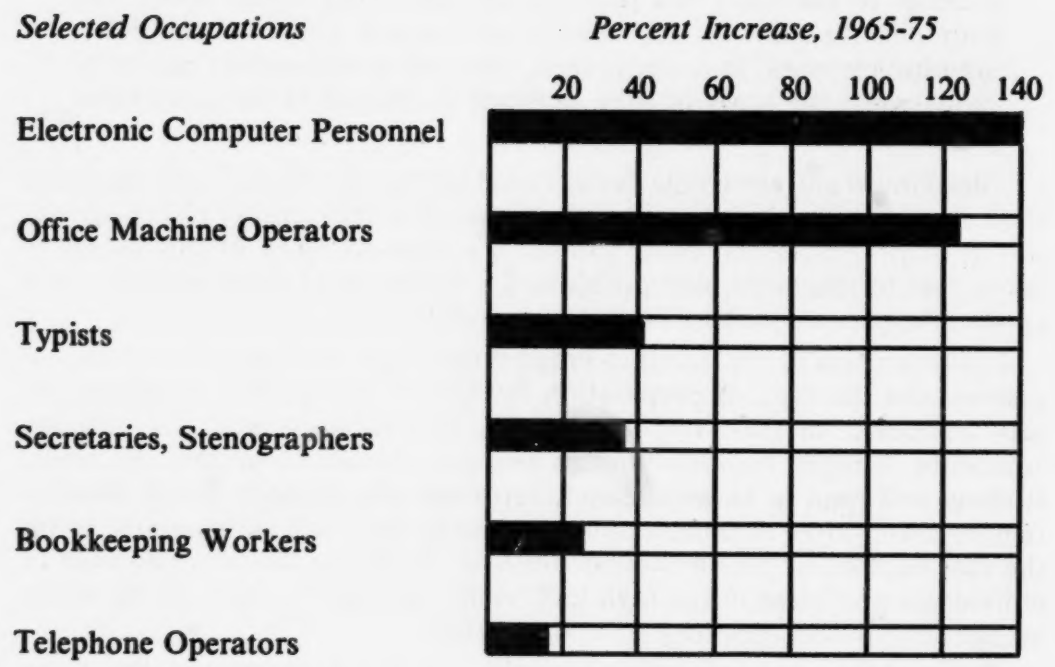
Labor Review (1969) reports that at the end of the Fourth Quarter, 1968, there were an estimated 12,889,000 clerical workers employed in the United States. This was an increase from 12,685,000 at the end of the First Quarter, 1968. The *Occupational Outlook Handbook, 1968-1969* estimates that there will be an increase of approximately 325,000 new clerical and kindred positions each year through the mid 1970's. This figure is in addition to the number of workers needed each year for replacement of persons leaving jobs because of retirement, death, and withdrawal.

The national picture with regard to employment opportunities now and in the future is reflected by studies that indicate that occupational opportunities for business education graduates in general will continue to grow. For example, according to data provided by Wellington (1968), employment opportunities for "Clerical workers between 1965 and 1975 will increase 30.8 percent as the numbers in the field grow from 11,200,000 to 14,600,000. During this same period, in the general field of office work, there will be new areas of opportunity emerging, such as in electronic computor personnel (up 140 percent from 100,000 to 240,000). Total U.S. employment during 1965 to 1975 will grow only 22.8 percent.

"The numerically greatest opportunity for employment will continue to be for secretaries and stenographers, which will rise 27 percent (from 2,225,000 in 1965 to 2,825,000 in 1975). Typewriting positions are fewer in number, but will increase 37 percent to 875,000. Bookkeeping workers will increase 16 percent to 1,350,000. . ."

Chart 1

Many Clerical Jobs Will Grow While Technology Changes



Source: Bureau of Labor Statistics

Wellington (1968) points to the fact that the American economy employs "12 million people to keep records or do other paperwork, handle communication, receive and ship merchandise, or handle fantastically complex electronic gear.

"Clerical workers cover a broad band of skills ranging from executive secretaries and computer operators to file clerks and messengers. More than one-half of all girl graduates of high schools work in clerical and related activities. . .

"Automation and computers will not affect increasing numbers of clerical workers whose duties include public contact, personal relations, and the exercise of judgment and initiative. The new positions created by growth in the volume of clerical work to be done will be far greater than the number of clerical jobs taken over by mechanication."

One should keep in mind, however, that "manpower projections are far from perfect; methods are crude at present, unforeseen technical changes occur, and the data are often inadequate" (Kaufman and Brown, 1968). However, "very detailed and accurate knowledge of the labor market is necessary, which is almost impossible in a market economy determined by many unpredictable variables. Furthermore, national projections are of limited use to the vocational educator, who is primarily concerned with the local area, yet local areas statistics are not widely available." (Kaufman and Brown, 1968)

Kallaus (1970) calls attention to the growing office function but contends that job levels in the office remain relatively stable:

> The office function continues to expand. As it does, it develops new jobs, uses new machines, designs new systems. At the same time it clings to necessary old jobs (using traditional office skills) and maintains the same job levels while adding new positions and deleting obsolete ones. It is clear, then, that job levels remain relatively stable while the types of jobs continue to change at an accelerated pace.

Mechanical and electronic devices used mainly for routine and repetitive clerical work will reduce the number of payroll and inventory clerks, checksorters, copy typists and other routine workers. As work of this nature is taken over by machines, new positions for operators of these machines will appear. People with the least education and skill will thus be threatened.

An awareness of the trends in employment opportunities in office occupations and the type of preparation needed by prospective employees to take advantage of these opportunities is, therefore, essential for business educators. If many business courses are not relevant to present demands, students will need to be immediately retrained. Or, students could possibly remain unemployed or underemployed because they lack skills needed to fill the vast number of jobs available. Business firms are facing a shortage of individuals proficient in the high level skills included in many of the office occupation job classifications (Hopkins, 1970).

Business firms, in attempting to overcome the shortage of skilled manpower, have placed increased emphases on training programs of their own.

Kleinschrod (1967), reporting on a prediction voiced at the 1966 American Management Association Training Conference, quoted the speaker as follows: "American business may soon spend more to train and reeducate its own personnel from the most marginal clerk to the most capable president, than all our school and college systems *combined* spend to educate youth."

Business teachers and curriculum specialists need to become informed as to the job opportunities available and qualifications necessary to fill these positions and make needed changes in the curriculum. Based on the findings of a study to determine the requirements for beginning office employees in selected Nevada business, Kirk (1966) concluded that there needs to be closer cooperation between businessmen and educators so that schools can fulfill business needs. It is doubtful that the specific objective of the secondary school business programs, as suggested by Kirk, should be that of fulfilling business' needs. However, most business teachers would agree that every effort should be made to fulfill students' needs. Closer cooperation between businessmen and educators could help to serve the needs of students.

In a rather extensive investigation, Malsbury, *et al.,* (1967) sought to identify the office job-entry positions in business firms in the State of Connecticut, the nature of the work the beginning workers are assigned to perform, and the knowledges, skills, attitudes, and understandings they need to perform the work. Because of the extensiveness of the findings and conclusions, no attempt is being made to summarize them here. However, the study is an example of what can be achieved when businessmen and educators decide to work together on an undertaking which is of value to both groups.

The national scene as compared to the local scene has always been a source of concern for those responsible for occupational education programs. However, as implied by Kaufman and Brown (1968), there is need for knowing what the local opportunities are for graduates. In business education, evidence seems to indicate that the local situation may be of more concern than the national picture. Frace (1969) found that 79 percent of the placements of business graduates were in the metropolitan area within a radius of 25 miles of the school from which they were graduated.

Although most of the research reviewed in this section is local in nature, it may have implications for all business educators when looked at collectively.

Preparation for Clerical-Stenographic-Secretarial Occupations

Several studies were reviewed which attempted to identify initial requirements for office positions. Downey (1966), Pekar (1967), Lindseth (1968), and Lovern (1967) found in studies done in Utah, Illinois, Minnesota, Wisconsin, and Georgia respectively that high school graduation was required for employment as typists, stenographers, secretaries and other clerical positions by most businesses. Kirk (1966) reported that most employers were satisfied with present high school business graduates and would hire persons who had no training above the high school level. Arm-

strong, *et al.* (1968) concluded from their investigations that the schools seem to be doing an effective job of providing the kinds and types of instruction that meet the needs of the workers in the entry office positions. Noodell (1967), investigating the requirements needed for successful employment in clerical positions, also found that high school graduates with business training can perform clerical duties successfully. However, the businessmen surveyed in his project felt that clerical workers need both business training and a good general education to enable them to perform the wide variety of duties necessary to meet the changing demands of business. High school graduation as a requirement for obtaining clerical positions was also one of Kesten's (1967) findings. However, he found that high school graduation was not required if the applicant had previous office experience.

In addition to the minimum of a high school diploma (required by most employers), also required as employment prerequisites by a majority of employers were business machines skills as well as such office skills as telephone training, letter writing, and the ability to greet and announce visitors (Downey, 1966). Suggestions given by employers for improved courses of study to better prepare office workers were in the areas of office skills, arithmetic, grammar, courtesy and good grooming, and a thorough knowledge of the overall business picture (Pekar, 1967). Lehto (1966) found that "social graces" were mentioned by employers as a factor frequently overlooked in employment preparation. Employers surveyed in her study expressed a demand for persons capable in skills involving shorthand, typing, and spelling. Many of these employers also expressed the feeling that one year of shorthand did not qualify students for employment involving the use of shorthand.

Telephone usage and typewriting were the most frequent duties performed; with accuracy, promptness, neatness, use of common sense, and ability to follow directions listed as highly desirable characteristics for individuals filling clerical positions (Lindseth, 1968).

Along with following directions, Lovern (1967) reported that the ability to concentrate on one's work was an important skill to be considered in employment. He also indicated that human relations was mentioned as the most complex part of the job.

Most beginning office workers began work in clerical positions, with some starting in such jobs as typing, filing, bookkeeping, and calculating machines. Copying machines, electric and manual typewriters, and ten-key adding machines were found to be the business machines most commonly used in Nevada businesses. Character traits of attitude, responsibility, and respect for property were listed as weaknesses of new employees by businessmen (Kirk, 1966).

Similar findings were reported by Kesten (1967) in that bookkeeping, filing, and the ability to operate various office machines were considered to be valuable assets in office workers. The character traits considered most important for satisfactory performance on clerical positions were attitude, attendance and dependability, the ability to get along with others, appearance, and the desire to learn.

Noodell (1967) also investigated the requirements needed for successful employment in clerical positions. His findings indicated that instructional units on automation, human relations, office machines, and office procedures should be included in the office practice curriculum. He added that a clerical worker's ability to do work accurately, neatly, and according to instructions is of greater importance to the employer than the quantity of work produced. The employers in his study felt that social, character and technical traits were of greater importance to the employer than mental or physical traits.

George (1966) was the author of a study that did not speak well of the occupational preparation of beginning office workers. His findings were: 1) One-third of the employers interviewed indicated that beginning employees did not know the kind of job for which to look; 2) Because of the beginning worker's inability to assess his qualifications and skills in relation to the demands of the job, employers felt that beginning office workers often chose jobs for which they were unsuited temperamentally or for which there was little employment demand; and 3) Two-thirds of the employers expressed the view that beginning workers had received no instructions concerning the important success factors and personal qualities necessary for job success.

Personal qualities also were emphasized by the employers when asked to list the primary reasons for rejection of applicants for initial office employment. Employers indicated that lack of desirable attitudes was ranked as important as lack of aptitude for the position (Pekar, 1967). Lovern (1967), however, found that the predominant reason for discharge of workers was unfit performance.

Paddock (1967) investigated the nature of the need for the development of personnel for high-level secretarial positions. She reported that a great deal of upgrading was necessary to bring the secretaries to the level of performance desired. She added that it would, therefore, seem that the minimum educational requirement should be the baccalaureate degree, preferably in business administration with a major in secretarial studies. There was evidence of a need for career-oriented personnel who are prepared for the position from the standpoint of education and experience.

Wagoner (1967), based on findings in her study, reached some conclusions which pertain primarily to top-level secretaries. Today's secretary performs two types of duties: a) those which are clerical or general in nature but are performed by the secretary in the capacity of assisting the executive, and b) those which are more narrowly defined as secretarial duties for which the secretary is primarily and usually responsible and which require a knowledge and understanding possible only through close contact with the situation. She added that the secretary's role is changing because the functions and duties related to written communication and those that assist the executive are of greater importance than formerly. The functions and duties related to office management and accounting are of lesser importance than formerly and have been delegated to others to perform because of increased specialization in these areas.

Preparation for Bookkeeping/Accounting Occupations

Numerous studies have been undertaken which attempt to determine work opportunities available and job preparation needed in the bookkeeping/accounting area. The studies are generally undertaken at the local level. However, sufficient information can be drawn from them to guide curriculum developers in their efforts.

Spanswick (1967) identified a number of manual bookkeeping jobs for which experienced and non-experienced employees with only a one-year course in high school bookkeeping were recently employed. The investigation revealed that the majority of firms advertising bookkeeping jobs were not willing to hire persons with only one year of high school bookkeeping unless those persons had experience in bookkeeping work. In most cases, these persons have had to enter the field of bookkeeping through a non-bookkeeping job. The employers in this study who were not convinced that the usual one-year course in high school bookkeeping is effective in preparing persons for manual bookkeeping jobs commented that experiences in a one-year course in high school bookkeeping were not realistic.

Stelter (1968) concluded that employment as a bookkeeper, or as an office worker with partial responsibility for bookkeeping is possible for many high school graduates in rural Minnesota. He based his conclusion on his findings where two-thirds of the employers indicated they would consider hiring a bookkeeping worker after graduation from high school. Only one-third of the businessmen felt previous experience was necessary for employment as a bookkeeper. Stelter's sample was much smaller than Spanswick's and included only firms located in cities over 50 miles from a population center in Minnesota of 50,000 persons or more. Firms included in Spanswick's study were located in the Chicago and New York City areas. Clow (1967) found that neither previous experience in office positions nor course work in accounting or bookkeeping was required for most bookkeeping positions. Shook (1967) reported that while high school bookkeeping is preferred for a beginning bookkeeper, it is not always a requirement.

Stelter (1968) found that extensive use of data processing equipment for bookkeeping or accounting purposes in rural Minnesota business firms is more than two years away. He also reported that the use of automatic data systems or equipment was small, and the future installation plans for such equipment were slight. Employers surveyed by Shook (1967), however, indicated a need for those who seek bookkeeping positions to be familiar with automated data processing procedures.

After Armstrong, *et al.* (1968) finished their investigation, they concluded that major emphasis should be placed on fundamental bookkeeping processes through the trial balance; students should continue to be trained in the recording of accounts receivable, accounts payable and payroll data; and accuracy in the manual recording of bookkeeping transactions should be stressed in the classroom.

Dependability and accuracy were the most frequently named traits that bookkeepers and accountants should possess. The teaching of accounting

principles should be a major objective of the one-year high school bookkeeping course (Clow, 1967).

Spanswick (1967) found that a person whose formal instruction in bookkeeping and accounting has not exceeded a one-year course in high school bookkeeping and who has been successful in securing employment in a manual bookkeeping job has usually found that job in a firm that uses a double entry bookkeeping system and prepares financial statements on the accrual basis. These employees are expected to be able to operate a typewriter, ten-key adding machine, full-key adding machine, and possibly a rotary calculator. They usually perform activities related to various banking procedures, the use of special journals, payroll records, accounts receivable records, and bookkeeping mechanics.

Clow (1967) also found that miscellaneous tasks such as typing, filing, and operating a calculating and/or adding machine are performed in many bookkeeping and accounting positions.

Stelter (1968) found that the least performed bookkeeping duties were in the preparation of financial statements and related schedules, in the recording of special journal entries, and in the use of bookkeeping machines and data processing equipment. Formal education in bookkeeping-accounting is helpful but not necessary to perform most of the duties of a bookkeeper. Only one-third of the employers in rural Minnesota firms surveyed stated that one year of high school bookkeeping was necessary for employment in their firms.

The majority of experienced workers who had completed a one-year course in high school bookkeeping indicated that either their on-the-job training or their experience was the primary source of learning how to perform bookkeeping duties rather than the formal class (Stelter, 1968; Spanswick, 1967; Clow, 1967; Shook, 1967).

Stelter's (1968) investigation showed that a high school education is adequate for employment as a bookkeeper but not as an accountant. Most accounting employees had attended some educational institution beyond high school. Clow (1967) also found that a high school diploma was required for most bookkeeper and accountant positions, but that the majority of accountants had completed post-high school accounting courses and had previous experience in bookkeeping and/or accounting positions. Shook's (1967) findings were similar to Stelter's and Clow's in regard to the high school graduation requirement for bookkeeping positions. However, the employers Shook surveyed felt that applicants for professional bookkeeping positions should have at least two years of post-high school accounting and/or previous experience in bookkeeping.

Women were employed and were preferred in a majority of bookkeeping positions, whereas men were employed and were preferred in a majority of accounting positions (Clow, 1967).

Preparation for Data Processing Occupations

Generally, research in the area of data processing has been limited to studies completed for advanced degrees. The findings of these studies,

although usually localized in nature, do support the findings of Bangs and Hillestad (1968). The Bangs and Hillestad project was national in scope and included a study of personnel needs as expressed by data processing managers to try to determine the common body of knowledge needed for entry into selected office occupations in data processing.

The findings concerning jobs and job opportunities in data processing as reported in this national study were:

1. High school graduates from data processing programs may enter the following data processing jobs: keypunch operator, unit record operator, tape librarian, and computer operator.

2. Graduates of two-year post-high school institutions may enter the same jobs as those who graduate from high school data processing programs, but in addition, the following jobs are available to them: programmer, systems analyst (with some further experience and training), and supervisor of data processing (with experience and possibly further training).

3. Generally, the jobs in data processing will become more complex rather than proliferate.

4. Computer manufacturers indicated that little change would take place in computers in the next three to 10 years except for miniaturization and greater memory unit capacity; thus, many of the jobs now available will continue to be prevalent for several years to come.

5. With the relative decrease in use of punched cards as input, the proportion of key punch and verifier operators will decrease.

6. Advances in the software will be extensive in the next three to 10 years; consequently, opportunities will expand for persons trained in the use of the new software as it is developed and accepted.

7. Programmers will not need to be as technically trained as is presently true. Graduates of two-year post-high school programs will be adequately trained for programming positions. However, the programmer as he is known today will become important to the bsuiness organization if he is prepared to move into a systems analysis position. Businesses will want their programmers to have the necessary background training to move into the position of systems analyst, or expect the programmer to continue his training on the job so that he may move into the higher level position.

8. Unit record equipment is being phased out with the installation of smaller computers. The position of unit record equipment operator will not be as prevalent in the near future as it has been in the past.

9. Opportunities for persons to program software equipment as it is developed with increase greatly.

10. Persons who will be classified as Applications Specialists will be increasingly in demand. These people will advise businesses on how to use automated systems.

11. An administrative level position possibly will emerge, a person known as an Automated Data Management Specialist, who will be responsible for deciding what to do with the data from the computer. His job will be to teach management through application.

12. As the use of time sharing increases, more and more business em-

ployees will need to understand automatic data processing. In a time-sharing installation many of the regular clerks will be responsible for originating and putting data into the automated data processing system. They will be required to be a part of the total system but will not necessarily hold a job classified as a data processing position.

Persons interested in additional detail, should obtain a copy of the Bangs and Hillestad study.

Kovach (1968) attempted to identify the present status and future outlook for employment of the high school graduate in the field of data processing in the St. Louis, Missouri area. She found that the highest educational level required for keypunch operators, tabulating machine operators, and tape librarians was a high school diploma. She also reported that the majority of the respondents required only a high school education for console and computer operators, programmers, and control clerks. In the area of systems and management, over 50 percent of the respondents required more than a high school education. She added, however, that all jobs except tape librarian and control clerks did require data processing knowledge *before* hiring.

Employers surveyed felt that the high school training most useful for potential employees would be data processing concepts and theory, mathematics, communication skills, general business subjects, bookkeeping, machine operation, and personal traits of dependability, logic, honesty, initiative, and flexibility (Kovach, 1968).

Richman (1967) reported that between 50 and 100 percent of the businesses surveyed used the keypunch, sorter, accounting machine, reproducer, verifier, and the collator, with the keypunch used by all of the businesses. Madson (1966) found the accounting machine was the piece of automated equipment most frequently used, followed in frequency by the keypunch, collator, and computer.

Kovach (1968) found the largest number of new employees were needed in keypunch and verifier operation and programming. This finding was reported in spite of the fact that most of the companies surveyed anticipated phasing out tabulating equipment. Managers were about evenly divided as to whether or not training on tabulating equipment should be eliminated.

Supervisory and management positions associated with data processing were held by men in all but two cases, while the tab and keypunch operations were jobs performed most frequently by women (Richman, 1967). Kovach's (1968) findings support Richman's findings: the majority of employees were men, and men were preferred as console and computer operators, systems analysts, and managers. Women, on the other hand, were preferred as keypunch and verifier operators and control clerks.

Madson (1966) and Richman (1967) also investigated the effect data processing has had on office employment in general. Madson reported that there has been little and Richman reported that there has been no reduction in the number of office personnel as a result of the installation of data processing equipment. However, Madson and Noodell (1967) reported firms surveyed were experiencing changes in their basic office operations with the addition of data processing equipment and services.

CURRICULUM DEVELOPMENT

General

Over the years curriculum developers have come and gone without giving much attention to what has gone on before. For example, Goodlad (1966) decries the fact that: "A substantial number of the new crop of reformers have approached the persistent, recurring problems of curriculum construction in the naive belief that no one had looked at them before." For further evidence of the influence of the past on the present it would be very revealing to read the chapter on the "History of Curriculum Thought and Practice" by Bellack (1969). Bellack points to some of the contemporary theories of curriculum and teaching from the past like the project method, the experience curriculum, behavioral objectives, activity analysis and programed instruction to mention only a few curriculum innovations of today having historical roots. Of special interest to business educators is the work of Bobbitt and Charters in the 1920's which stressed activity analysis and the need for detailed objectives stated in behavioral terms. Both undoubtedly influenced the present thinking of certain theorists such as Ralph Tyler, Benjamin Bloom, and David Krathwohl (Bellack, 1969).

Three continuing concerns of curriculum specialists are identified by Caswell (1966) as: 1) assuring sound sequence or continuity in the curriculum, 2) establishing consistent relationships between general goals of education and specific objectives that guide teaching, and 3) designing curricula that provide a reasonable balance of emphasis among the various areas of study. These areas of concern are recognized by those who work in business education curriculum development, as are the forces responsible for determining the direction of curriculum changes such as: 1) advances in technology, 2) special interest groups, 3) the culturally disadvantaged, and 4) governmental programs (McNeil, 1969).

One attempt at incorporating new philosophy as well as encompassing some of the recent forces affecting curriculum is the Educational System of the 1970's (referred to as E.S. 70) involving some 18 experimental schools in the United States and partially funded by the U.S. Office of Education. The basic feature of the E.S. 70 program is essentially a curriculum that is "learner centered" rather than process or subject matter centered. The integration and interaction of the components will be a result of careful systems design. There will be no discrete demarcation between academic and vocational skill training or between these and other parts of the systems. The curriculum must be developed so that each activity relates logically to all other activities and leads to the efficient attainment of the behavioral objectives (Morgan and Bushnell, 1967).

Secondary Education

Lanham and Trytten (1966) stated that: "The status of the curriculum in business education is one of uneasiness and confusion." They based this statement on the percentage of studies designed to investigate, improve or

evaluate the curriculum appearing in the *National Business Education Quarterly* each year. The number of studies with these objectives has not decreased during the years covered by this review and synthesis.

A number of guides have been prepared for use by business teachers, supervisors, teacher educators, and curriculum directors for the improvement of the business curriculum. These bulletins are usually prepared by study groups representing the two main purposes of business education—education about business (economic understandings) and education for business (occupational preparation). Most of the curriculum guides are prepared under the sponsorship of and are financed by federal or state governments.

These guides serve a useful but limited purpose. If those who are responsible for the preparation of the guides are endowed with the wisdom and "biases" consistent with the needs of students in the field, then worthy ends are served. However, the contribution of such efforts, after numerous compromises by committee members is usually limited at best. At any rate, studies should be made to evaluate these guides.

Wanous (1968), in reference to curriculum planning, indicated:

"A convincing majority of the leaders involved in this study believed that one or more programs should be organized and offered around major occupational areas. They did not believe that all business courses should be offered on an elective basis to all students. Moreover, they believed that major business sequence. Office practice, which frequently appears on the year.

"The majority favored the offering of sequences organized around general clerical, stenographic, and distributive occupations. The majority also favored the organization of a general business sequence consisting of such courses as economics, general business, business law, typewriting, and merchandising.

"In the judgment of these leaders, typewriting, general business, economics, and bookkeeping should be required of all students pursuing a major business sequence. Office practice, which frequently appears on the required list, was placed on the required list by only a small percentage of the leaders. In practice, at least, economics is a newcomer to this list."

However, many of the business education programs in the secondary school remain over the years, rather traditional and possess a certain degree of "sameness" from school to school and state to state. (Data Processing Research Project, 1968).

Rather than continuous evaluation of the current business curriculum some efforts are being made to undertake programs which will, in fact, change the business curriculum.

The Joint Council on Economic Education, with the cooperation and consultation of representatives from the field of business education, has launched a three-year secondary school program in economic education through the business curriculum.* Previous experiences of the Joint Coun-

* Information about this curriculum development project may be obtained from the Joint Council on Economic Education, 1212 Avenue of Americas, New York, New York.

cil with Developmental Economic Education Programs was focused upon economic understanding as developed through the social studies curriculum. The new program is aimed directly at the business curriculum. The three-year project, 1969-72, will focus intensively upon the four major aspects of curriculum development: teacher education, course structure, development of study materials, and evaluation.

As a result of more than 20 years of leadership in helping schools develop economic education programs, the Council has compiled a handbook for curriculum workers (Symmes, 1969).

Francis Brown (1968) compared the effectiveness of an experimental business education system called the Senior Intensified Program (SIP) with the traditional business education system in preparing students for entry level clerical and retail occupations. Brown concluded that both systems were equally effective in preparing students to perform satisfactorily in entry jobs in clerical and sales occupations. He added, however, that the experimental system (Senior Intensified Program) was more efficient than the traditional system because it prepared the students in 50 percent less time.

The majority of the research undertaken in the curriculum area, however, continues to be done through studies designed to investigate or evaluate the curriculum; not to change it. John Gibson (1967) studied the status of the offerings available and enrollments in business education and the relation of business education to other subject fields in Mississippi high schools. His study revealed that even though business education is entirely elective, it ranks immediately after English, social studies, mathematics, and science as measured by number of teachers, number of classes taught, and class-period enrollments. Business programs (total business subjects taught in a school) differ widely with 136 different programs existing in the 439 schools. Offerings in many schools seemed to be adequate for the needs of students, and the subjects were chosen by impressive numbers of students. Offerings in other schools were inadequate, with the array of subjects offered in some schools inappropriate. Programming practices in a few schools seemed questionable. Gibson's data revealed a glaring weakness, office practice, shorthand, and typewriting; the actual objectives, identified as employment-oriented. Business subjects considered to be an important part of the general education of all students were not available to students in many schools.

In a study done at Colorado State College, Hitzelberger and Hollinseed (1968) compared the opinions of selected business classroom teachers in the secondary schools throughout the nation with those of business education leaders. Comparisons were made of current classroom objectives, practices, and requirements in bookkeeping, general business, office practice, shorthand, and typewriting. Desirable objectives, practices, and requirements in these five subjects were also investigated.

Their findings lead them to conclude that "Not only do the opinions of teachers and leaders differ concerning desirable objectives, practices, and requirements in the subject matter areas of bookkeeping, general business, office practice, shorthand, and typewriting; the actual objectives,

practices, and requirements in these subject matter areas in the secondary schools throughout the nation do not reflect the opinions of either teachers or leaders."

The purpose of a study conducted by Weber (1969) was to determine the curriculum priorities in the training of secretaries based upon an analysis of the opinions of secretaries, executives, and secretarial teachers concerning the relative importance of skills, knowledges, and personal traits needed for successful secretarial employment. The subjects completing the Q-sort, which was used to gather the data along with two information forms, were secretaries, executives, and secretarial teachers in the Phoenix, Arizona metropolitan area. All three groups agreed that personal qualities or traits were more important for secretarial success than either fundamental or specialized skills and knowledges. Among the items considered most important by all three groups were dependability, accuracy, initiative, and cooperation. Among the items considered least important by all three groups were data processing, operating duplicating or photocopying machines, an understanding of the services that banks render, and operating adding and calculating machines. Weber recommended that the secretarial group opinion be used as a guide for the secretarial teacher when assigning curriculum priorities.

There is increased concern about the inclusion of data processing in the business education curriculum. Recent evidence indicates that electronic data processing should be an area of curriculum development for the secondary school (Data Processing Research Project, 1968). Questions arise, however, as to where data processing should be taught, how much should be taught, and who should be doing the teaching. Manning (1968) surveyed business educators and businessmen to try to determine the subject matter content and the depth of the material for an introductory data processing course. He found that all of the business educators and businessmen responding indicated that an introductory course in data processing should be offered at the secondary level. However, business educators and businessmen could not agree on the depth of coverage needed to teach computer programming concepts in an introductory data processing course. COBOL was the first choice of a specific computer language for an introductory course, and AUTOCODER was the second choice of the two groups. Both groups surveyed would prefer that students have hands-on experience with data processing equipment. It was felt that students should have a basic understanding in the various areas of punched card data processing and the function and capabilities of the keypunch, sorter, and collator.

Gertrude Gibson (1967) held personal interviews with heads of data processing installations in 103 businesses located in the Greater Boston area. Information was solicited regarding the type of employee now needed in the automated office, general recommendations for the high school and college curriculum, and the educational preparation and personal characteristics the businessmen desire in the employees working in data processing installations. Recommendations concerning the high school curriculum, given in the order of the frequency in which they were mentioned, were: give a

general data processing orientation course for everyone, stress general education, teach keypunch and programming, concentrate on mathematics and logic, stress philosophy of data processing and concepts of business systems, and stress the importance of reliability and accurate work habits.

Bangs and Hillestad (1968), after analysis of the data collected from managers of data processing departments, employees in the data processing departments, teachers of data processing, and advance planning executives of the computer manufacturers, developed recommended data processing curricula and course outlines for secondary and for two-year post-secondary schools.

In addition to the recommended secondary and post-secondary curricula, Bangs and Hillestad found that:

1. The educational institutions are not preparing enough persons to meet the demands of business. More emphasis must be placed on the preparation of more teachers so that more young people may have the opportunity to be trained in data processing.

2. Communications skills, both oral and written, are demanded of data processing personnel. Both the management personnel and the employees in data processing recognize a weakness in this area which is not being remedied by our educational institutions.

3. Data processing personnel need to be oriented to the total systems approach in business. The educational institutions have not been satisfying this need for the persons in data processing positions.

4. Because the field of data processing education is so relatively new, the programs in the high school and post-high school institutions are somewhat similar except that more concentration in data processing courses is found at the post-high school level. The major objective of the courses at both levels was vocational training.

5. Mathematics is considered a prerequisite for data processing courses at the post-high school level whereas it is not for the high school level programs in data processing. Managers felt that mathematics should be included as part of a data processing program for its logic values rather than as mathematics per se. Several managers suggested courses in logic be included in the curriculum.

6. Relatively few schools operate a cooperative part-time training program in data processing. Only 50 schools out of 176 schools surveyed had such a program.

7. Three-fourths of those high schools with a cooperative program in data processing require up to six weeks of on-the-job training.

8. Half of the cooperative programs in the post-high schools (nine out of a total of 18 programs) have no set amount of time required for on-the-job training phase of the cooperative part-time program.

9. No opportunities are available in data processing for workers with no specialized training. Persons must either have some specialized training before being placed on a data processing job or may transfer from a job within the firm and receive on-the-job training in data processing

resulting in specialized training. Some companies may hire persons without specialized training and give that training to the new employee before putting him on the job.

10. Because the need for data processing employees is so much greater than the number of people being trained in our educational institutions, industry currently is willing to hire persons who have a specialized skill regardless of where they have received their training.

11. Computing machines will be more and more internally programmed, with the result that wiring will become less important in business. However, these persons still will be needed in the technical positions with the computer manufacturers. Many of the programs (particularly in post-high school programs) devote a considerable amount of time on wiring boards. This is a skill development that needs less emphasis in training for business data processing jobs.

Community College—Junior College

One role of the community college is to provide education that is based on a community's need. The purpose of a study completed by Simon (1967) was to determine the role and the curriculum offerings of the business education department at Rockland Community College based on ascertained needs for trained personnel, present and projected, of the business community in Rockland County. The needs were determined by utilizing a structured interview questionnaire. An analysis of the data appeared to indicate a yearly need during the next few years of approximately 6,000 trained personnel in 19 job categories for whom business education could be provided at the college. The data enabled the construction of programs of study by course title for each of the positions for which business education could be provided at the college. Recommended modifications, additions, and deletions in course content were also made based on the data gathered.

Griffiths (1967) defined and validated eight curriculum objectives of public community college business programs to determine the present and future importance of these objectives. He found that the most important present objective is transfer education. In the future, the semi-professional and technical objectives will be of equal importance with the transfer objective. There was close agreement nationwide on the increasing importance of the supplemental objective. The retraining objective will be of increasing importance, but there was a reaction against it among personnel surveyed in different geographic regions. Substantial disagreement exists on the importance of the developmental objective, which provides training for initial employability. Opportunity curricula, which provide basic remedial training, are considered of little importance, as is the avocational objective. Griffiths added that each of the objectives will become increasingly important.

Tjornhom (1967) investigated patterns in business curricula in selected junior colleges. She also examined the philosophy behind the formulation of the curricula to see why certain patterns developed. Curricula found were of three types: two-year terminal, one-year terminal, and two-year trans-

fer. Tjornhom reported that the three two-year terminal curricula offered most often were the secretarial, the general business, and the stenographic curricula; the three transfer curricula offered most often were the business administration, the business education, and the accounting curricula. She added that the principal reason for a student enrolling in a business curriculum was employment preparation. The principal reason for adding subjects to the business curriculum was to strengthen course offerings, while the principal reason for discontinuing subjects was repetitious course content.

A descriptive study of junior college business curricula was completed by Carter (1967). Two of the purposes of this study were: 1) to list the courses offered and to determine which subjects were offered most frequently in junior colleges, and 2) to determine if the business courses tended to cluster into curriculum divisions. Carter found that courses tended to cluster into four different divisions: General business, secretarial, accounting, and special business areas. The subjects most frequently offered were: shorthand, typewriting, real estate, and accounting. He also reported that the size of the community and the size of the junior college had an effect on the subjects offered in the business departments of the junior colleges, with the broader curricula offered in the larger schools and larger cities.

A survey, with one of her objectives being to determine shorthand courses offered and objectives of shorthand instruction at the junior college level, was conducted by Stutte (1968). The responses to her survey indicated that the majority of junior colleges represented in the study provided shorthand instruction with the dual purpose of providing: 1) terminal education for students planning to enter office occupations, and 2) background for continuing education at a four-year college or university. The majority of the respondents did not consider personal use or exploratory purposes as important objectives for shorthand instruction. The returns also indicated that a rather limited number of specialized secretarial courses (e.g., legal, medical, and technical) are being offered in the public junior colleges surveyed.

As mentioned in the *Secondary Education* part of this chapter, Bangs and Hillestad (1968) proposed a post-high school curriculum in data processing, as well as outlines for courses in the curriculum.

The findings concerning data processing curricula at both the secondary and post-secondary levels are given on pages -

Four-year College

In a study mentioned previously, information was collected from heads of data processing installations regarding recommendations for the college data processing curriculum. Recommendations concerning the college curriculum, given in the order of the frequency in which they were mentioned, were: offer a general data processing orientation course for everyone; offer a major in data processing; offer a specialized course in data processing with principles of analysis, logic, and programming; offer data processing as part of general business management training (Gertrude Gibson, 1967).

One hundred programmers of business applications were personally interviewed to determine the education each programmer had received, the conditions which surround the programmer's work activities, and the frequency of occurrence of selected topics from the fields of accounting, mathematics, and statistics within the work activities of each programmer (Davis, 1966). These data were sought in order to develop a model four-year curriculum for business applications programmers. The findings and conclusions of Davis were quite extensive and are not in complete agreement with other studies which have been done in regard to programmers. Some of his findings and conclusions were:

1. Employers of business programmers prefer an employee who possesses a degree in mathematics or business or a combination of business and mathematics.
2. Accounting seems to be the first preference of employers for a major concentration in business.
3. Specialized training, closely associated with the computer involved, is inevitable for a newly employed programmer, regardless of the amount of formal education the programmer has experienced.
4. The technical learning experiences provided in a formal curriculum should be such that the future programmer will develop a well-rounded background concerning the field of data processing and a technical vocabulary which will enhance intelligent conversations regarding the use of data processing equipment.
5. The multiple number of departments with which the programmer must communicate indicates the importance of including formal learning experiences to develop adequate communication skills and to develop an understanding of sociological and psychological factors which influence human behavior.
6. The courses recommended for inclusion in the major area of specialization for business applications programmers should represent the fields of accounting, mathematics, statistics, and written communications. They should help to develop the background needed to carry out computer science functions. These courses should be followed by courses in computer science which incorporate the student's background of business studies with actual business applications utilizing computing machinery.
7. The first minor area of specialization should consist of accounting courses.
8. The second minor area of specialization should include basic courses in several areas of a general business nature. These courses should represent the fields of marketing, business law, finance, and communications.

EDUCATIONAL PROGRAMS

Typewriting Programs

Kraft (1967) investigated the achievement in the one-year typewriting course in high school of those students who had a semester of previous typewriting instruction in junior high school and those without previous

typewriting instruction. He reported that students who had had previous typewriting instruction were able to type at a significantly faster base rate on three-minute timed writings than were the beginning students. However, the difference decreased from 10.4 to 4.7 words a minute during the year. No significant difference existed between the two groups on five-minute and ten-minute writings. Also, no significant difference was found between the two groups in accuracy on production problems. Based on findings such as those of Kraft, one questions the value of introducing students to typewriting at the junior high school level.

An attempt was made to determine to what extent the students in the eighth and ninth grades of the Kaukauna (Wisconsin) public school system who had personal-use typewriting the previous year (seventh or eighth grade) were using their typewriting skill. A structured interview was used with each of 85 students to gather the data (Kilgas, 1967).

Some of the conclusions drawn by Kilgas were:

1. The group of students who used their typewriting skill tend to have a higher average I.Q. score than the students who do not use their typewriting skill.

2. According to the students' opinions, one year of personal-use typewriting at the seventh or eighth-grade level does not appear to be sufficient for the majority of students who participated in the study.

3. The study seems to indicate that the higher the typewriting speed score of the individual student the more likely that student will be to use his typewriting skill.

4. According to the information gathered in the study, it appears to make little or no difference if the students are enrolled in the eighth or ninth grade as to whether they use their typewriting skill.

In spite of the investigator's conclusion that one year of personal-use typewriting does not appear to be sufficient for the majority of the students, Kilgas also concluded that students at the seventh or eighth-grade level can gain sufficient typewriting skill to be useful to them for personal typing purposes and that typewriting offered at the seventh or eighth-grade level is worthwhile because a majority of students report that they use their typewriting skill for various activities each week.

There is increasing emphasis on the use of the typewriter as a learning tool. This is especially true in the elementary and early junior high school grades.

Grindberg (1966) conducted a study to determine: 1) if the successful completion of a course in personal typewriting suggested a significant difference in achievement in reading, written languages, and spelling from those who did not complete the course, and 2) the extent to which the students who completed the course in personal typewriting were utilizing their typewriting skills. One group had completed a summer course in personal typewriting following the sixth grade, and the other group had not enrolled in it. The responses to questionnaires from students who had completed the typing course, as well as the responses of eighth-grade English teachers, were used to determine the extent to which students were utilizing their typewriting skills. The two groups were compared as to performance in the

sixth grade on the language arts sections of the Iowa Test of Basic Skills and in the eighth grade on the language arts section of the Stanford Achievement Test. Grindberg found that there were no significant differences when the groups were compared on the Stanford Achievement Test execpt that the difference between the boys and the girls who completed the typing course was significant in the spelling section, in favor of the girls. When scores of the language arts section of the Iowa Test of Basic Skills and the Stanford Achievement Test were compared, there were no significant differences found. Students who completed the personal typewriting course rated it highly in regard to the skill acquired and also related that it helped them in all areas of language arts, particularly spelling and punctuation. However, the teachers of these students noted little difference in the quality of the work of a particular student whether it was typed or handwritten.

Shorthand Programs

A study undertaken by Drexler (1967) and also published by the New York State Education Department (*The Process and Product of Machine Shorthand Programs in New York State Schools,* 1968) sought information concerning the vocational use of machine shorthand. The study revealed that graduates of the machine shorthand curriculum who were utilizing their shorthand skills received higher salaries than the manual shorthand graduates who were employed utilizing their shorthand skills. However, manual shorthand writers were more successful occupationally than the machine shorthand writers in the following ways:

1. Obtaining employment using their shorthand skills.
2. Obtaining part-time employment using their shorthand skills.
3. Receiving promotions which included salary increments.

The investigators recommended that the basis for introduction of machine shorthand programs should be considered on an individual school system basis with factors of local employment and acceptance, cost, faculty competency, and the nature of the student group to be served by the program given closest consideration.

Powell (1968) attempted to obtain specific information that would support the initiation of a program in machine shorthand. She conducted a survey of the manufacturing industries in the Rockford (Illinois) Metropolitan area to determine the present and future demands for stenographer-secretaries. Findings reported by Powell were:

1. The 510 manufacturing industries used in the study employed 677 manual shorthand writers, 840 dictation-transcription personnel and 8 touch shorthand operators.

2. Increases expected in the next five years were: manual shorthand writers, 18.6 percent; dictation-transcription personnel, 15.3 percent; touch shorthand personnel, 1 percent.

Powell concluded that a machine shorthand course could not be justified at that time. This conclusion supports the recommendation made in the previous study that machine shorthand programs be considered on an individual school system basis.

Edgar Smith (1966) compared the learning difficulty of The Forkner Alphabet Shorthand System with the Gregg Shorthand System, Diamond Jubilee, as measured by the dictation speed and standard words correctly transcribed of eleventh-and twelfth-grade high school students. The major finding, as reported by Smith, was that the achievement of the Forkner students was significantly higher than the achievement of the Gregg students—at each speed level, in each grade-point level, and in each set of dictation. He concluded that: 1) the Forkner Alphabet Shorthand System is easier to learn than the Gregg Shorthand System, Diamond Jubilee; 2) the learning progress of the first-year Forkner shorthand students is greater than the learning progress of first-year Gregg shorthand students; 3) the Forkner Alphabet Shorthand System is better adapted than the Gregg Shorthand System, Diamond Jubilee to the above average, average, and below-average achievers; 4) for a one-year shorthand course the Forkner system is superior to the Gregg system; and 5) if the speed of 80 words a minute is used as the minimum speed requirement for initial employment, neither the Forkner nor the Gregg shorthand students meet the requirement for initial employment as shorthand writers after one year of study.

Bookkeeping / Accounting Programs

Linnaus (1968) undertook a study to identify a comprehensive high school bookkeeping and accounting program. Linnaus developed an instrument comprised of 43 principles and practices judged sufficiently important, by a jury of experts, for identification of a comprehensive high school bookkeeping and accounting program. This instrument was submitted to 125 NABTE representatives who were asked to identify and evaluate, according to the principles and practices making up the instrument, an outstanding high school bookkeeping and accounting program in their geographic areas. Seventy-two outstanding high school bookkeeping and accounting programs throughout the United States were identified and evaluated. Linnaus found that, according to the criteria established by the jury's evaluation of the principles and practices, few, if any of the 72 outstanding high school programs identified were completely comprehensive. Generally, high school bookkeeping and accounting programs building for comprehensiveness make main efforts in meeting the essential criteria in the areas of objectives, courses or levels of instruction, contents of courses, grade placement of courses, materials and facilities of instruction, and teacher preparation. High school bookkeeping and accounting programs building for comprehensiveness tend to defer making provisions for essential criteria in the areas of guidance, automation, and evaluation of the program.

Accola and Brechlin (1967) used a questionnaire to identify how former bookkeeping students were utilizing bookkeeping principles learned in high school bookkeeping classes. They found that more former bookkeeping students used their knowledge for personal use than for vocational purposes. They also reported that the majority of vocational bookkeeping applications fell into the following activities: recording of transactions, banking ac-

tivities, sales related activities, and payroll activities. The respondents also indicated that the principles of debit and credit are essential and that an understanding of bookkeeping terminology was necessary. Based on their findings, the investigators established an experimental class which used no textbook, had no homework assignments, and the students were exposed to teacher-made problems emphasizing the findings of the survey. At the end of the semester, an examination prepared by the publisher of the textbook and an examination prepared by the investigators based on the course syllabus used in the experimental class were administered to both the experimental and a control class. Accola and Brechlin found no significant difference in the scores on either examination.

Data Processing Programs

The status of data processing courses and/or units of instruction was the subject of investigation for Hallstrom (1968). She concluded that data processing courses have developed, for the most part, in large high schools and the courses reach few students. She added that the data processing courses are generally brief introductory courses and do not lead to job competency. Data processing equipment available is almost exclusively unit record equipment.

Giles' (1967) findings support those of Hallstrom. He found that most of the schools he surveyed (94.4 percent) do not offer a course in data processing. Those that do offer a course usually offer a one-semester course in the eleventh or twelfth grade. Most schools that offer only a unit on data processing teach this unit in office practice.

Hallstrom concluded that business teachers are interested in data processing as evidenced by the number who have received formal education in the field. Giles, however, found that 50 percent of the data processing teachers have had only three to six semester hours of training in data processing.

Little research has been done in the area of college data processing programs. Schuetz (1966) studied the teaching of business data processing in the colleges and junior colleges in Kansas, 1965-1966. He concluded that the state colleges offer a more complete program within the business data processing field as compared to universities and junior colleges. He found that all institutions were moderately equipped with unit record machines.

Clerical Programs

In a study done to identify those areas of Office Procedures I and II that employers feel should receive greater emphasis and those areas that they feel should receive less emphasis, David Carter (1967) surveyed several hundred office supervisors throughout the Los Angeles Area. Based on his findings, Carter concluded that business teachers should: 1) use more class time for teaching spelling, punctuation, penmanship, numbers, symbols, numeric filing rules, procedures for handling office mail, typing from rough draft material, and for teaching the use of telegraph and cablegram services, the switchboard, and reference books; 2) use less time for

teaching alphabetical filing rules, data processing, skill in typing letters and business forms, and the use of the telephone; 3) emphasize the fact that there is a demand for office employees who are able to follow both oral and written directions; and 4) stress the importance of desirable personal traits, and how important they can be in maintaining a job.

Kobylus (1968) concluded that: 1) the number of clerical workers is increasing rather than decreasing; 2) there is at the present time an increasing need for school prepared general clerical workers; 3) it is possible to identify knowledges and skills that are basic to most clerical jobs; 4) there is a place for a specialized clerical program on the high school level; 5) the clerical office practice course is significant and of primary importance in the clerical curriculum; and 6) there are essential units of instruction which should be included in the development of a clerical practice course. She also developed a proposed course outline for the clerical office practice course.

Povodnik (1967) surveyed selected public high schools in Kansas, Oklahoma, Arkansas, and Missouri to determine the content of the office machines courses. She recommended that: 1) since office machines have become an important part of today's business world, the primary objective of the course should be to develop vocational competence in the use of office machines; 2) office machines instruction should be given during the senior year of school; 3) the basic machines that should be included in the office machine courses are ten-key adding-listing machines, full keyboard adding-listing machines, key-driven calculators, printing calculators, dictating machines, stencil and fluid duplicators, and manual and electric typewriters; and 4) the results of the study showed that an acquaintanceship level of training is sufficient on the basic office machines. However, it was recommended that a mastery level be attained on both the manual and electric typewriter.

It would seem that there is a descrepancy between recommendations one and four since on the one hand vocational competence is recommended and on the other hand acquaintanceship level is suggested. Probably the biggest weakness of the study is that recommendations are based on what schools are using and doing, not on what businesses are using and doing.

Cooperative and Work-Experience Programs

Miller (1968) completed a study in the Mount Prospect, Illinois High School District in which he attempted to determine the school's holding power of students classified as potential dropouts if they were placed in a specially designed work-experience program. In addition, he attempted to determine if the students in the experimental or work-experience group received higher grades than students in a control group; if attendance of students in the experimental group was better than attendance of students in the control group; which group created the most discipline problems; and which group participated more actively in extra-curricular activities. Four hundred sixty-two students were identified as potential dropouts and were invited to participate in a work-experience program. One hundred

five accepted. Of the remaining 357 potential dropouts, a control group of 105 students was formed. The experimental group attended three classes (physical education, English, history, and science or mathematics) in the morning with the regular school population and participated in a work-related class. They worked in the school building in the afternoon. The students in the control group continued their regular course of study as they normally would.

Miller found no significant difference to show that the work-experience program contributed to the holding power of students in the school. Also, no significant differences were found to indicate that the work-experience program improved the attendance of potential dropout students, that the work-experience program was responsible for increasing the number of student activities in which potential dropouts participated or that the work-experience program reduced the number of discipline problems in which potential dropouts were involved. Miller added that an analysis of the data by individual schools offered evidence from which one could infer that in some schools the work-experience program was beneficial for some students. He based this statement on the fact that in one school a significant difference in the number of dropouts was found, while in other schools a significant difference was found for grade-point average and for attendance. The program might have been more successful had the students been placed in an actual business setting, rather than placed in the school building for their work assignments.

Bledsoe (1968) investigated the difference between the educational development of students who had participated in state-approved diversified cooperative education programs and that of students who had not participated in cooperative vocational education programs in selected secondary schools in Indiana. Subjects for the study were full-time secondary school students. Each student was matched within a school and graduating class according to sex, age, achievement as measured by the pretest Composite Score of the Iowa Tests of Educational Development (ITED), and attendance during the school year in which the pretest was administered. Bledsoe concluded that state-approved diversified cooperative education programs afforded participants an opportunity for general educational development comparable to that offered students who had not participated in cooperative vocational education programs. He added that rejection of diversified cooperative education on the basis that it deprives the participant of an opportunity for general education development is neither justified nor realistic.

Driska (1967) studied the current and recommended practices and procedures in office education at the public secondary school level. His study included both cooperative and noncooperative programs. State supervisors of business education were asked to report current practices and procedures in office education in their states. Chairmen of business education departments in National Association of Business Teacher Education schools and teacher educators of office education were asked to recommend practices and procedures in office education for their states. Based on the data he collected, Driska indicated:

1. Cooperative office education programs and block programs are, and should be, the most frequently offered office education programs at the secondary school level.

2. Cooperative office education classes are, and should be, offered at the senior grade level; noncooperative office education classes are, and should be, offered at the junior and senior levels.

3. Data processing, human relations, and office machines are the areas of office education in which additional materials are most needed; simulated office materials and programmed materials are the kinds of materials most needed.

4. Noncooperative office education students are, and should be, selected on the basis of a career objective in office occupations and business course prerequisites.

5. Cooperative office education students are, and should be, selected on the basis of career objectives in office occupations and employability from the standpoint of having fundamental skills and personality traits.

Hodge (1968) investigated the role of cooperative office education in the development of favorable attitudes toward office work. He administered the Stuart Attitudes Toward Office Employment Scale as a pre- and post-test to determine the effect of cooperative office education upon the attitudes of students. Subjects were 100 randomly selected cooperative office education students and a parallel group of 100 noncooperative office education students also randomly selected. Hodge found that there was no significant difference in attitudes toward office work between the experimental group and the control group on either the pretest or the post-test. He concluded that students enrolled in cooperative office education programs and students enrolled in noncooperative office education programs have favorable attitudes toward office employment as measured by the Stuart Attitudes Toward Office Employment Scale and that any difference in attitudes toward office employment between the two groups may be attributed to chance. He added that students' attitudes toward office employment do not change significantly in a one-semester period.

Lewis (1966) and Pendleton (1968) conducted similar studies at Kansas State College, Pittsburgh. Lewis used a questionnaire to survey cooperative education coordinators in Missouri, Oklahoma, Kansas, and Arkansas concerning their cooperative office education programs, school enrollment and teacher-staff statistics, and the college educational and work experience background of the coordinators. Findings related to the program were: 1) the secretarial program is the predominant office education program offered, with the least predominant being bookkeeping; 2) the majority of the coordinators responding require a "C" average for the prerequisite subjects; 3) the majority of the coordinators include both senior semesters for cooperative training programs; and 4) type of work available, training facilities, and employer interest in the program are the three top screening factors used in selecting training stations. Lewis also reported that the five most frequently mentioned problems encountered by the responding

coordinators were: 1) scheduling of students' school classes, 2) selecting competent student trainees, 3) lack of coordinating time, 4) placement—lack of training stations, and 5) inadequate school facilities.

Pendleton investigated the cooperative education programs presently operating in high schools and junior colleges of Iowa, Kansas, Minnesota, Missouri, Nebraska, North Dakota, Oklahoma, and South Dakota. Office education coordinators in these states completed a questionnaire concerning their cooperative office education programs, school enrollment and teacher-staff statistics, and the education and work experience background of the coordinators. Pendleton's findings were: 1) the one-year clerical program is the predominant office education program offered; 2) Typewriting I is a prerequisite for participation in a large majority of the programs offered; 3) about half of the coordinators require a "C" average in the prerequisite subjects; 4) the majority of the coordinators include both senior semesters for cooperative training programs on the high school level; 5) on the junior college level of instruction, half of the schools surveyed include cooperative office training in the first semester of the freshman year; and 6) the most frequent cooperative office education training plan is one-half day of school and one-half day of work. The problem areas receiving the greatest response were lack of coordinating time, inadequate school facilities, scheduling of students' classes, and selecting competent student trainers.

Lee (1966) also studied cooperative office education programs, but did so to determine the nature and extent to which such programs serve the needs of low-average ability students. Lee reported that teacher-coordinator interviews indicated that low-average ability students benefited from participation in cooperative office education programs. However, the majority of students who were enrolled in Illinois State Board of Vocational Education approved high school cooperative office education programs were of average or above-average ability, and relatively few low-average ability students were being served by cooperative office education programs. Major problems encountered in working with low-average ability students, as reported by Lee, were: 1) the difficulties in obtaining training stations for this type of student, 2) the development of appropriate personal qualities in low-average ability students, and 3) the lack of adequate materials for the classroom instruction of such students.

Industry Programs

Ashburn (1967), Irmer (1967), and Tedesco (1967) undertook studies exploring office training programs offered in business and industry.

Ashburn (1967) studied the purpose and nature of training programs for office employees in the Los Angeles area. She reported that of the companies responding, over half indicated that they offered education or training of some kind for their office employees. She found that the programs were of two types—formal and informal. The formal programs follow a predetermined pattern and are arranged in course format, while the informal programs are not formally organized and the training usually

takes place on the job and has no set time or length. A majority of the program offered were formal in nature. Reasons given by respondents for providing company training programs were to:

1. Orient beginning office employees to company policies, procedures, and terminology.
2. Help the beginning office employee meet the required company standard in shorthand and typewriting skills.
3. Provide additional instruction for young employees to help bridge the gap between school achievement and the requirements of business.
4. Provide specialized training in operational procedures.
5. Provide experienced office employees with training to improve their performance on the job.
6. Meet the demand for skilled office employees.
7. Keep up with technological changes by providing instruction in the operation of new business machines.
8. Accelerate and control the training process in order to better meet the needs of the company.
9. Reduce turnover and permit promotion from within the company.
10. Provide a service to the employee by making training available and by helping the employee gain advancement through training.

Tedesco (1967) did an analysis of in-company and out-of-company educational and training practices for clerical workers of leading firms in the Greater Boston Area. Although some of Tedesco's findings are similar to Ashburn's, enough are different to warrant a listing here. She reported that companies prefer to train clerical workers by using one or more on-the-job training techniques rather than by employing outside training agencies or by conducting in-company formal training programs. She also found that the larger a company's clerical force, the more likely the company is to provide clerical workers with full or partial tuition aid for evening school or college courses, in-company formal training programs, and training provided by out-of-company agencies. Other findings reported by Tedesco were: 1) formal training programs conducted by companies and by outside agencies generally focus upon the immediate clerical training needs of a worker or company rather than upon helping workers prepare for job advancement or for meeting long-range company goals; 2) a gap exists between clerical training provided in schools and clerical training required for on-the-job performance; 3) the number of companies with substantial training programs for clerical workers is distinctly small; 4) in-company formal training programs often include some form of supervised on-the-job training or simulated office experience; 5) many companies that conduct formal training programs do not utilize research methods in planning and developing their programs and do not evaluate and follow up their training efforts in any way; and 6) there is a lack of valid evidence concerning the value of training programs.

Irmer (1967) limited her study to formalized in-service educational programs for clerical, stenographic, and secretarial office employees in selected insurance companies. She reported findings too extensive to

enumerate here. However, some of the more applicable findings were: 1) more on-the-job training is conducted for office employees and supervisors than for middle-management personnel and executives; 2) individual companies conduct educational programs according to the needs of office employees; 3) most formalized in-service educational programs conducted for office employees vary in length according to the nature of the course; 4) the teaching methods and techniques and the types of instructional materials used in formalized in-service programs are similar to those most frequently used in secondary school instruction; 5) the primary objective of a large majority of formalized in-service education programs is that of increasing employees' skills, knowledges, and attitudes; and 6) a majority of educational programs established for office employees in the selected insurance companies have been so successful that the companies plan to expand training facilities, train more office personnel, lengthen educational programs, or use a combination of these factors in revising their present programs.

INSTRUCTIONAL MATERIALS AND DEVICES

Many of the studies pertaining to instructional materials and devices could have been included in other chapters. For exapmple, studies related to devices or equipment could have been reported in the chapter titled *Facilities and Scheduling*. Other studies involving materials and devices could have been included in the *Learning Processes and Teaching Methods* chapter. However, after considerable deliberation it was decided that all studies surveyed which pertained to instructional materials and devices would be included in this chapter.

Typewriting

Selberg (1967) compared the effectiveness of the Educational Developmental Laboratories, Inc. (EDL), Skill Builder Controlled Reader and Typing Keyboard Introduction Course with the traditional method of teaching beginning typewriting at the secondary level. He compared the rate of growth of two typewriting groups in gross words per minute and gross errors as measured by the results of one- and three-minute straight copy achievement tests. Selberg reported that: 1) EDL's typewriting course correlated with the Skill Builder Controlled Reader was an effective method and device for teaching beginning typewriting since greater speed in typing was attained by its use; 2) while the experimental group recorded higher gross words per minute on all tests, the control group reported the fewest gross errors on all of the typing tests; and 3) the error differential between the groups was found not to be statistically significant.

Akridge (1968), in two adult evening classes, compared the relative effectiveness of two methods of teaching numbers in elementary typewriting classes. Both groups were taught by the same teacher and received the same instruction except that the Skill Builder Controlled Reader was

used with the experimental group for supplementary instruction in the typing of numbers. The groups were compared on mean gain in stroking rate and mean reduction of errors from a pretest to a post-test.

Akridge's major finding was that on a three-minute statistical copy test, the mean improvement for the experimental group was highly significant. The mean reduction in errors per minute was higher for the experimental group than the control group on the three-minute statistical copy test. This difference, however, was not significant. Akridge concluded that supplementary instruction and drill on numbers appear to result in improved proficiency in the typing of numbers. She added that the superiority of the experimental group was sufficiently demonstrated to warrant continued experimentation with the Skill Builder Controlled Reader as a supplementary aid in the teaching of numbers.

McAnally (1966) designed a study to evaluate the use of a mechanical pacing device—the SRA III Reading Accelerator—in improving the typewriting skills of students enrolled in intermediate and advanced college typewriting. Students in both experimental and control groups used indentical typewriting drill materials, followed the same class procedures, had the same instructors, and practiced for approximately the same length of time. The only difference in the groups was that the experimental groups used mechanical pacers in typing specially prepared exercises in class; the control groups typed the same exercises without the use of mechanical pacers. McAnally reported that:

1. The mean differences in both gross words and correct words typed a minute, between the experimental group and the control group after 14 weeks of training were not significant.

2. The mean net words typed a minute by the experimental group was significantly higher than the mean net words typed a minute by the control group.

3. The experimental group had a significantly better accuracy rate on five-minute timed writing after 14 weeks of training than the control group.

4. The use of mechanical pacers appears to be more beneficial to students enrolled in intermediate typewriting classes than to students enrolled in advanced typewriting classes at the college level. The usefulness of the aid in either intermediate or advanced typewriting classes appears to be in reducing the error rates of students; the use of the aid appears to have little or no effect upon the stroking rates of students in intermediate or advanced typewriting classes at the college level.

5. Students with initially low typewriting rates appear to benefit more from the use of mechanical pacers than students with initially high typewirting rates.

Bastady (1967) matched students according to teacher, sex, class in school, and manual or electric typewriter. After the students were matched, background music purchased from a background music service, was introduced into the experimental classes and used throughout the experimental period. He found that there were no significant differences between the control and experimental groups on either speed or accuracy.

The primary purpose of a study done by Bartholome (1968) was to investigate the possibility of improvement in spelling by second semester ninth-grade typing students through the use of spelling drills designed especially for typing classes. Findings, as reported by Bartholome, were:

1. Evidence clearly indicated that the spelling lessons did increase the spelling ability of students who typed the lessons.
2. The spelling lessons appeared to help the experimental students to achieve better scores on straight copy, rough-draft copy, and statistical copy typing tests. This superiority was shown on speed scores for all three types of tests and on straight copy and rough-draft copy error scores. Only on statistical copy were error score differences not significant.
3. Adjusted mean differences on post-proofreading tests revealed no significant differences between experimental and control groups.
4. Evidence indicated that the spelling lessons helped the students to express themselves in typewritten form. Not only did the experimental groups express themselves with more words, but they were also more accurate in their spelling.
5. Spelling training also appeared to help the experimental students to divide words properly at the ends of typewritten lines.

Bartholome recommended that typing textbook authors should include spelling training in their books.

Neinfeldt (1967) and Wise (1968) studied typewriting textbook content. Neinfeldt (1967) tried to determine to what extent actual business practices parallel the textbook theory in the specific areas of typing business letters, correcting errors, and preparing multiple copies. Based on his findings, he concluded that: 1) the basic letter styles found in typewriting textbooks are the same letter styles used most frequently in actual business; 2) office employees may use any error corrective device as long as the results obtained are acceptable; 3) businesses prefer that the same letter style be used throughout the firm for the sake of uniformity; 4) copying and duplicating machines are used extensively where exact copies and quantities of extra copies are required. At least one file carbon is prepared for all business letters; and 5) a definite parallel exists between textbook theory and actual business practice as it relates to the typing of business letters, correction of errors, and preparation of multiple copies.

An interesting recommendation made by Neinfeldt was that "an attempt should be made to determine if business firms establish the trends in the typing and handling of business correspondence or if the methods taught in the schools are the influential factor in setting the trends."

Wise (1968), in a study similar to the one completed by Neinfeldt, compared the materials obtained from businesses offices in the Denver, Colorado metropolitan area with the production materials contained in the second semester portion of selected high school typewriting textbooks to see if the textbooks adequately reflected current materials. Based on the findings, which were not as positive as those of Neinfeldt, Wise concluded that, to reflect adequately the materials produced in Denver business offices, the textbook publishers should change their current content by: increasing

the usage of unusual words (not included in the Silverthorn list) to 26 percent of the total words; increasing the use of numbers containing not more than four digits to 11 percent of the total words; increasing the use of numbers containing five digits or more to three percent of the total words; maintaining their current usage of symbols; increasing the number of tabulations to 42 percent of the total production material; decreasing the number of manuscripts to seven percent of the total production material; increasing the number of memoranda to eight percent of the total production material; and decreasing the number of letters to 43 percent of the total production material.

Pohland (1966) undertook a study to determine if beginning typewriting students who began initial instruction on the electric typewriter could transfer basic typewriting skill to the manual typewriter more effectively than beginning typewriting students who began initial instruction on the manual typewriter could transfer basic typewriting skills to the electric typewriter. He concluded that typewriting proficiency on timed writings, including both speed and accuracy, can be transferred from the electric typewriter to the manual typewriter and from the manual typewriter to the electric typewriter without any significant difference in speed or accuracy.

Edwards, *et al.,* (1968) explored the use of an audiovisual-tutorial laboratory in the secretarial skills area. This study included two skills courses—business machines and beginning typewriting. The business machines phase of this study is reported later in this section.

A complete beginning typewriting course was prepared using films, slides with tapes, tapes alone, and printed instruction units and tests. Twenty units in which demonstrations were necessary were filmed on 16 millimeter film, edited, and transferred to 8 millimeter continuous-loop film cartridges. The narration was synchronized on a magnetic sound stripe. Fourteen units of instruction on such topics as manuscripts, postal cards, and business and personal letters were prepared on slides with accompanying tapes. Taped instructions only were used for three units, and two instructional units and four test units consisted of printed sheets only. Twenty-one additional tapes, providing skill building drills and practice timings for production work and straight copy, were also prepared for the course. These tapes were used at practice stations with portable cassette tape recorders rather than in carrels. Handout sheets containing practice and drill assignments were also prepared for all film, slide and tape units.

The results of three-minute timed speed tests and an objective-type test indicated that the audiovisual-tutorial method of learning was superior to the traditional classroom method for those students with no previous typewriting exposure. The investigators concluded that the skills of typewriting can be more effectively learned by replacing the traditional classroom situation with the audiovisual-tutorial system used in this study. Students, in general, preferred the audiovisual-tutorial system to the traditional system. One of the weaknesses of this study was that straight-copy timed writings and objective tests were the only tests used on which to make comparisons. It would also have been valuable to compare the groups on production-type tests.

Shorthand-Transcription

The purpose of a study undertaken by Minnick (1967) was to evaluate the worth of the principle of spaced review in shorthand. She reported that the use of special dictation material designed to provide a systematic recurrence of brief forms and their derivatives enables students to write and transcribe brief forms more accurately. She added that the effect of the special dictation material was still apparent six weeks after its final use with regard to the accuracy of brief form outlines but not with regard to accuracy of brief forms in transcripts. Also, the higher degree of accuracy with regard to brief forms that the experimental students were able to achieve had no apparent effect on speed achievement. Minnick concluded that the degree of difficulty of a brief form seems to be related to its Silverthorn rank.

Because many researchers have referred to the Silverthorn vocabulary list, the findings of an investigation by West (1968) will be reported at this point. West's findings pertain to both typewriting and shorthand.

The Silverthorn basic vocabulary of written business communication was reanalyzed in order to furnish accurate difficulty indices for instructional and test materials for stenographers and typists. Among the 11,055 different words in the reanalyzed list, 109 occur at least once in every 1,000 words of context. Mean syllabic intensity (number of speech syllables per dictionary word) was found to be 1.54. Mean stroke intensity (number of typewriter strokes per dictionary word) was found to be 6.0 (4.67 letters plus 1.0 spaces plus .3 for the incidence of punctuation). These values substantially exceed and should replace the conventional 1.50 and 5.0 estimates. Otherwise, the proficiency of stenographers and typists will be overestimated. It was also found that the validity of "percentage of common words" as an index of difficulty depends on the length of the common-word list. When the list is short, that index has a near-zero correlation with frequency of occurrence in the language. Further, shorthand dictation on the basis of the "standard word" (even at syllabic intensity 1.54) is an insufficient equalizer of difficulty. The addition of "percentage of words among the 1,500 (or 2,000) commenest" is recommended (West, May 1968). In this article, West gives the percentage distribution of cumulative segments of the business vocabulary and discusses the probable impropriety of using a business vocabulary as a basis for instruction and test materials in personal typing courses.

In a study that included an investigation of methods as well as materials, Gallion (1968) tried to determine which combination of speed-development methods and speed-practice materials produced the best results in beginning (college level) shorthand classes. Two types of dictation material were used: 1) especially prepared vocabulary-controlled passages, and 2) passages taken from the textbook. The two speed-development methods were a presentation of preview work prior to the dictation practice and the tracing of especially prepared shorthand plates during dictation practice. Gallion reported findings as follows:

1. The students receiving the vocabulary-controlled dictation material

received slightly higher means on five of six dictation tests given at the end of the experiment. The difference, however, was significant on only one of the six tests.

2. No significant difference existed between the mean scores achieved by students who traced and those who received preview words.

3. The scores achieved by individual students on each of the six dictation tests tended to be nearly the same regardless of the speed at which the dictation was given.

In a somewhat different type of doctoral study, Freeman (1967) created supplementary instructional material for students learning the Stenoscript system of shorthand. She developed a series of five filmstrips, containing 50 business letters. The filmstrips, which were especially prepared for a selected class of students of less-than-average achievement in school subjects, were used in the classroom to assist students in learning to read and write Stenoscript, as well as to transcribe from Stenoscript outlines. After the filmstrips had been used extensively in the selected class, a manual was written to accompany the filmstrips. Both the filmstrips and the manual were submitted for validation to teachers in other schools, to persons in supervisory positions, and to persons in teacher training institutions. All of these persons judged the filmstrips and manual to be valuable supplementary instructional media.

Robert N. Hanson (1966) attempted to determine whether there were significant differences in performance of first-semester college Gregg shorthand students doing homework by self-dictation from textbooks (visual stimulus) and students doing homework from textbooks and tape recorded dictation of the textbook plate material (combined audiovisual stimuli). Hanson's analysis led him to conclude that first-semester college Gregg shorthand students who do their writing in the traditional manner by self-dictation from textbooks achieve a superior knowledge of principles of the shorthand system than do students who do their writing from recorded dictation with textbooks open for reference. He also reported that neither homework method is superior in developing skill at reading from textbook plate material after 15 clock hours, skill at writing from practice-matter dictation after 30 clock hours, or skill at writing from new-matter dictation after 45 clock hours of formal instruction. Punctuation and spelling skills, attendance records, and the number of hours of out-of-class practice were not affected by the homework method.

Studies to determine the effectiveness of programmed Gregg shorthand materials were completed by Clark (1967) and O'Connell (1967).

The purposes of O'Connell's study (1967) (high school level) were: 1) to compare the achievement of students in the first semester who were taught the theory of Gregg shorthand through programmed materials with the students who were taught with the conventional textbook procedures, and 2) to compare the achievement of those students at the end of the second semester who had been in the programmed sections the first semester with that of the students from the textbook sections in the first semester. O'Connell concluded that: 1) students in the programmed

sections were able to write correct shorthand outlines from word lists more effectively than students in the textbook sections; 2) while the textbook students showed a superiority in ability to take dictation at the end of the first semester, there was little or no difference at the end of the second semester between the two groups; and 3) the speed in completing the lessons were slower with students in the programmed sections than it was with textbook students.

Clark (1967) developed programmed homework lessons for learning Gregg Diamond Jubilee shorthand theory to determine experimentally if the programmed materials were more effective than traditional methods in reaching the objectives of a beginning junior college shorthand class. Clark concluded that junior college students can learn shorthand theory through programmed instruction. She went on to say that students using programmed lessons took shorthand significantly faster than students who learned shorthand theory through conventional methods because additional class time was released for dictation practice. On the basis of her findings she recommended that junior colleges explore further the use of programmed materials for teaching.

Moyer (1967) studied the effectiveness and efficiency of using programmed instruction to review punctuation in college level transcription classes. She reported that: 1) students who use programmed material to review punctuation in transcrpition classes can punctuate printed matter and transcripts as well as students who are subjected to a conventional method of review; and 2) programmed review of punctuation is more efficient than conventional review because the programmed method can be utilized outside of class, thereby providing additional class time for practice in the transcription phase.

Business Machines

The purpose of a study by Walters (1968) was to determine whether students in college office machines receiving individualized taped instruction would attain comparable achievement to those students receiving traditional instruction. In this study, the control and experimental groups used the same textbook and followed an identical content, assignment, and test schedule. However, the control group received traditional classroom instruction and the experimental group received all of their instruction from tapes prepared by the researcher. After analyzing his findings, Walters concluded:

1. The students in college office machines who received taped instruction achieved as well as students who received traditional instruction.
2. Students reacted favorably to the taped instruction in office machines.
3. Students receiving taped instruction in office machines may be able to complete assignments in slightly less time than students taught by traditional instruction.
4. Through the use of taped instruction, it may be possible to handle larger enrollments in office machines without additional staff.

5. The maintenance costs and downtime of machines might be substantially reduced as a result of the use of taped instruction.

The study (also reviewed under typewriting in this section) conducted at Lansing Community College, Lansing, Michigan (Edwards, *et al.,* 1968) was an exploration of the use of an audiovisual-tutorial laboratory in teaching business machines. In developing the instructional materials for the bsuiness machines part of the study, it was felt that the need for demonstrations prohibited the use of slides as the primary visual media. The investigators used moving film as the primary media. Each lesson contained demonstrations of a particular machine operation and two examples of problems being completed by that operation. A review of some previous operation or technique was included in each unit, after the first. Films were made on 8 millimeter film and a magnetic stripe was added for sound. The narration was synchronized on the stripe after the units were placed in continuous-loop cartridges. The instructional units were used in rear-screen projectors, along with an assignment sheet indicating practice problems and other pertinent information for each lesson. The control group was instructed by the traditional classroom method while the experimental group received instructions from continuous-loop sound films in individual carrels. The experimental group had no assigned class hour and students were allowed to enter the open laboratory on an unrestricted schedule. Based on their findings in the investigation, the investigators concluded that the skills of business machine operation can be more effectively learned by replacing the traditional classroom situation with the audio-visual-tutorial system as used in the study, since the treatment group showed significantly better performance on final exams than did their regular-class counterparts. A student opinion questionnaire showed that students generally preferred the open-laboratory method of learning over the traditional classroom method. It was concluded that the availability of machines and instructors for the experimental group contributed in a major way to the difference in attitude found.

Bookkeeping / Accounting

Huston (1966) analyzed the structure of programmed instruction. After this analysis he applied it toward the writing and evaluation of a specific unit for high school bookkeeping. He concluded that a classroom teacher may be able to construct bookkeeping programs that are just as effective as the conventional method of instruction. When tested with a small group of students, the constructed bookkeeping program produced a performance on a criterion test significantly better than the conventional method of teaching on questions involving theory and mathematical calculations. He reported that a majority of the students who used the bookkeeping program prepared for his study responded favorably to programmed instruction. Of all the objections raised to the program, more complained of being bored than any other single factor.

Some of the limitations of programmed instruction, as reported by Huston, were: 1) different methods are needed for presentation of certain

types of material; 2) difficulty of satisfying the needs of all students through the use of one program; 3) programmed materials can be used for only short periods of time; 4) costs of machines and materials; and 5) shortage of programs in certain subject areas.

Advantages of programmed instruction reported by Huston were: 1) provides for individual differences, 2) promotes learning at a pace best suited to each student, 3) presents material in an organized form, 4) provides immediate knowledge of results, 5) helps the teacher to be more flexible in the classroom, and 6) saves instructional time.

Wegner (1967) compared the effectiveness of the programmed textbook method and the conventional textbook method of teaching beginning bookkeeping. She found a significant gain in the learning of basic bookkeeping concepts by the students taught with the programmed text method. There were, however, no significant differences between groups in: 1) student achievement as shown by the results of the final examination, 2) student ability to construct bookkeeping forms and reports as shown by an analysis of successfully completed problems, and 3) student motivation to continue into the second semester of bookkeeping.

Wegner did conclude, however, that the use of a programmed textbook facilitated learning, allowed the teacher to give individual instruction as needed, and freed him for other educational duties. She added that, as the students proceeded at their own rate, individual differences were taken into account in the learning situation.

Gibbs, *et al.,* (1968) compared the effectiveness of programmed instructional materials and conventional instructional materials in the teaching of bookkeeping concepts and their subsequent transfer to the solving of a problem (the performance of the basic bookkeeping cycle). Two high school classes were designated as the programmed instruction group, and two high school classes were designated as the conventional instruction group. There was no significant difference between the two groups in terms of IQ and pretest scores.

The materials used by the conventional instruction group were the *20th Century Bookkeeping and Accounting* (1962) textbook and the accompanying study guides and working papers. In addition to these materials, the blackboard was frequently used for group demonstrations and explanations.

The materials used by the programmed instruction group were a program developed by Fahrner and Gibbs entitled *The Basic Bookkeeping Cycle* and an accompanying response book. The program contained material equivalent to the first 10 chapters in the textbook used by the conventional instruction group. The program consisted of 512 frames and was presented in a horizontal format. In the programmed group, no instructional materials were used other than the program and the response book.

Three tests were administered to both groups upon the completion of instruction. Two of the tests were standardized tests obtained from South-Western Publishing Company and designed to be used with the *20th Century Bookkeeping and Accounting* textbook. These tests consisted of matching and multiple-choice questions which measured key concepts and vocabulary through chapter 10. The other test was the Fahrner-Gibbs book-

keeping cycle test developed by the authors of the program to measure the complete cycle, or all material covered by the first 10 chapters in the textbook. The Fahrner-Gibbs test differed from the South-Western tests in that it did not measure isolated concepts and vocabulary but, instead, measured the total task-handling process which subsumes the concepts. In the Fahrner-Gibbs test, the students were given basic information pertaining to the assets and liabilities of a service business, business transactions for one month, and a packet containing all necessary blank forms. The students were then asked to complete the bookkeeping cycle.

The investigators reported that results of all three tests showed significant differences in favor of the programmed instruction group. Upon analysis of each of the tests, it was found that the programmed instruction group scored lower on the sections measuring vocabulary. However, the programmed instruction group scored significantly higher on the sections measuring total concepts. The investigators concluded that on the basis of the significant gains in achievement and problem solving ability, the substantial reducation in learning time, and the opportunity for the teacher to individualize bookkeeping instruction, it does appear that programmed materials can be used successfully within the existing classroom structure to substantially improve the efficiency of bookkeeping instruction.

Calhoun and Calhoun (1968), in an independent research project, compared the reading achievement scores of high school bookkeeping students with the readability level of four bookkeeping texts widely used at the secondary level.

The Calhouns concluded that: 1) reading achievement of bookkeeping students ranged from seventh grade to college level; 2) approximately half the students tested were reading below their school grade placement; 3) the readability range of the bookkeeping texts ranged from sixth grade to college graduate; and 4) the traditional bookkeeping instructional material is not suitable for many students.

It was recommended by the Calhouns that every bookkeeping teacher should strive to develop: 1) student reading skills, 2) meaningful word concepts by students before reading, 3) student awareness of the multiple meaning of bookkeeping terms, and 4) a specialized bookkeeping vocabulary within the framework of the learner's experience.

Basic Business / Economic Education

Pennock (1967) investigated the applications of audiovisual and other appropriate media in teaching general business. She reported that while little was found to indicate exactly how the various teaching aids were used, it seemed reasonable to assume that general business teachers were using the media available to them. She also reported that existing literature seemed to indicate that the stage of change will continue to prevail in general business and that the future is likely to bring more and better audiovisual aids, a greater number of self-teaching devices, a change in the role of the teacher, and more attention to individual differences among students than is true at the present.

Attempts are being made to make use of the various teaching aids and materials in the basic business/economic education area. Investigations of their use in an experimental situation, were undertaken by Eckert (1967) and Patsloff (1967).

Eckert (1967) compared student achievement and retention in general business. A control group was taught in a traditional manner, and an experimental group was taught using specially prepared transparencies in addition to traditional techniques. Two units of instruction were used: 1) Making Effective Use of Credit, and 2) Using the Services of Banks.

Some of Eckert's findings were:

1. There was a significant difference in mean achievement on the two units, in favor of the experimental group.
2. There was a significant difference in mean achievement of students in both groups when classified by ability level. The difference was in favor of the higher ability students.
3. There was a significant difference in retention on the credit unit by students over an 11-week period in favor of the experimental group and the higher ability students.

The purpose of the study undertaken by Patsloff (1967) was to investigate the effectiveness of various financial education materials in modifying the expressed attitudes of high school students toward personal finance. Eight teachers in the Greater Metropolitan Area of Detroit, Michigan were selected from those who had attended a workshop on financial education materials. Students participating in the study were enrolled in courses of basic business, bookkeeping, consumer economics, home economics, English, mathematics, and typewriting. The experimental students were given 15 days of instruction with materials and visuals prepared from the Financial Education Teacher's Kit. Control and experimental groups were given attitude and information tests before and after the instruction. Experimental students changed significantly more in a positive direction than control students in attitude. Students in lower socioeconomic level area school systems and lower average IQ classes changed attitude significantly more than students in higher socioeconomic level area school systems and higher average IQ classes, respectively. Students of teachers: 1) who were under 35 years of age, 2) who changed their own attitudes about finance in a positive direction, 3) who had a greater variety of financial experience, and 4) who were highly enthusiastic about teaching finance changed significantly more than other students. The study showed that attitudes of a high school student can change in a positive direction after only 15 days of instruction. She concluded that if the instruction were extended over a longer period of time—a semester course, or emphasis in several courses—it is reasonable to expect significant positive change in the students' understanding of finance problems.

In a nationwide experiment involving 48 colleges and universities and 4,121 students, programmed texts were found to be an effective means of teaching the typical elementary economic concepts course (Attigeh, *et al.*, 1969). In fact, the evidence indicates that students by spending an average

of 12 hours with programmed materials learned practically as much micro- or macro-economics as did students in seven weeks of a traditionally taught elementary economics course. A second result of the study indicates that "... on the basis of the test question breakdown, students who used only programmed learning materials, as compared to conventionally taught students, performed better on 'applications' of theory than on simple 'concept recognition' " (Attigeh, *et al.,* 1969). The authors concluded that "students had a generally positive attitude toward programmed learning and toward the subject of economics and that the basic concepts and tools of economics can be taught within a period of about two weeks, thus making it possible for students to devote more time to the application of basic theory to 'real world' problems" (Attigeh, *et al.,* 1969).

Miscellaneous

The purpose of Ivarie's (1968) study was to determine if any significant differences in achievement occurred when collegiate students of business communications were taught grammar, punctuation, and capitalization by: 1) the lecture-discussion classroom teaching method, 2) an overt response programmed instructional unit, and 3) a covert response programmed instructional unit.

On the basis of his study, Ivarie drew the following conclusions:

1. Teaching methods had no significant effect on achievement as measured by the California Language Test or as measured by the Criterion Test.
2. Low ability students learned significantly more than high ability students regardless of the treatment experienced, as measured by the California Language Test, but not as measured by the Criterion Test.
3. No interaction between ability and treatment was observed.
4. The lecture-discussion method of presentation took more time than either of the programmed instruction methods of presentation; however, the time required to complete the overt response programmed instructional unit was not significantly different from the time required to complete the covert response programmed instructional unit.
5. No significant differences were apparent among teaching methods and levels of ability in terms of the amount of time required to complete the unit of instruction.

Braach (1966) undertook a study in which he attempted to determine relationships between the educational background and training of business administration students and their proficiency in decision-making. The technique used in the study involved the use of programmed players who made the decisions for all but one of the firms in the industry, whose decisions were made by one student participant. This was done for the purpose of controlling the interactive elements of the simulation, to introduce an absolute and consistent standard of competition, and to isolate the decisions made by each student participant while retaining the dynamic and competitive aspects of the simulation. The research program involved the use of

of a computer-programmed general management decision simulation, which simulates an interacting multi-firm industry designed primarily for teaching and research purposes. Most of the students participating were graduating seniors, some were second-year graduate students, and some were business executives participating in a management development program.

Braach reported that statistically significant results were obtained for both individual and group decision differences for variables which measured both decision equality and style. He found that the participants in general achieved rather poor results relative to the programmed players as measured by percentage of industry profits and sales. It was found that the undergraduate student background factors analyzed—age, GPA, years of business experience, and father's occupation—were not related to decision-making proficiency. The graduate students obtained slightly better profits and were more aggressive and less conservative than the undergraduate students on the whole. The managers' profits were the lowest of the three groups. The managers were also the most conservative and least aggressive.

Stroh (1968) undertook a study in which he used video tape feedback in the development of listening skills by experienced industrial salesmen. A control group individually role-played with an instructor for five minutes. Each role-playing performance was audio taped and, without role players' knowledge, also video taped. However, other members of the control group did not see or here the role-playing performance. This was followed by a six-minute self-evaluation and the instructor's critique in private from audio tape replay but *without* any self-confrontation via video tape for each of three sessions. An experimental group followed exactly the same procedure except with the knowledge that their performances were also being video taped and would be played back.

Stroh reported that self-confrontation via video tape seems to result in a two-stage process. After the first performance and self-confrontation via video tape replay, the second performance for most subjects in the experimental group was less effective in the areas measured. Conversely, after the second performance and self-confrontation, the third performance for all subjects in the experimental group was more effective in the areas measured. The two groups achieved approximately the same overall score improvement in the areas measured. The findings suggest that when using educational role-playing and critique methodology with video tape replay, each student should be provided at least three performances. Seeing oneself on video tape seems to interfere with the learning process initially, but subsequent exposure does enhance the learning process. A possible weakness of this study was the very low number of subjects used in the experiment.

One investigator attempted to ascertain the effect of hands-on time on the learning of selected data processing concepts, and student attitude (Robert D. Hanson, 1968).

The experimental treatment involved the use of machines during eight selected class hours. During these eight hours, the time was devoted to

machine demonstrations. Students in the control group received identical instruction during these eight hours, except that machines were not used. Extensive use was made of transparencies to simulate the instruction received by the experimental group. There were nine outside projects given, four of which involved hands-on machine time for the experimental group. The control group received identical assignments, but they were prepared by manual methods.

Conclusions reached by Hanson were:

1. The experimental group scored slightly higher than the control group on both unit-record and computer concepts achievement tests. However, the differences were not statistically significant.

2. Following the presentation of unit-record concepts, no significant differences were found in student attitudes toward the content. However, highly significant differences in student attitude toward content were found between the groups following the instruction on computer concepts.

3. The experimental group had a more favorable attitude toward course expectation fulfillment following both the unit-record and computer instructional periods.

4. The experimental group rated the methods of instruction employed much higher than did the control group after both the unit-record and computer instruction.

An interesting study done in the elementary school and in the social studies area, but which has implications for business education, was conducted by Holden (1967). Teachers completed data sheets describing relevant characteristics for each of their pupils and selected objectives they wished to achieve during the teaching of a selected unit. The experimental group received a computer processed Resource Guide, which consisted of two parts: 1) suggestions for group activities which were related to the selected teacher objectives for the unit being studied, and 2) suggestions for individual activities which were related to the individual characteristics of the pupils in the class and the selected teacher objectives. A team of trained observers recorded pre- and post-instructional behaviors for each of the teachers in the sample, using Jason's Instruction Observation Record adapted for use in public schools by Goldberg. Based on his findings, Holden drew the following conclusions:

1. There was a difference between the regular instructional behavior of a varied selection of teachers and the instructional hehavior of the same teachers recorded at the time when they were following plans that were developed from computer based resource guides.

2. Resource guides significantly affect some dimensions of instructional behavior but fail to produce significant change in other dimensions. The significant changes in instructional behavior of teachers who used resource guides were changes that increased the number and improved the quality of the following individualized instruction tasks: a) encouraging pupils to engage in independent thinking; b) creating an accepting atmosphere in the classroom; c) making appropriate selection and use of instruc-

tional materials; d) making appropriate selection and use of teaching methods; e) motivating pupils through challenge without threat; f) employing a wider variety of instructional materials; g) using a greater number of individual and small group methods of teaching, and fewer large group methods; and h) encouraging more pupil involvement and interaction.

3. Resource guides failed to produce significant changes in teachers' sensitivities to the needs of pupils or in their sensitivities to the effects of the physical setting.

4. Resource guides have practical utility value in education and can be employed effectively in: a) curriculum planning, and b) the improvement of instruction.

Holden added that the improvement of instruction through unit teaching can be furthered by using the resource guide in preservice education and in-service education programs.

LEARNING PROCESSES AND TEACHING METHODS

Numerous studies have been completed in the area of teaching methods. These studies will be discussed under the following subject headings: typewriting, shorthand, business machines, miscellaneous.

Typewriting

Price (1967) compared the effectiveness of the chalkboard approach in introducing and learning the keyboard to the traditional textbook method. She reported that the results of the study indicated that the chalkboard approach to learning the keyboard produces higher gross typewriting speeds, with no decrease in accuracy, than the traditional textbook method.

Koeppen (1966) identified letter combinations that appeared common to all typists. He used a mechanism by which a paper tape was drawn through the typewriter printing point at a constant speed. As the subject typed, letter combinations appeared through their relative position on the tape. Certain high frequency combinations of the four fastest typists were incorporated into drill material and were presented to beginning typists throughout the school year. On the basis of straight copy tests for speed and accuracy, it appeared that the experimental drills caused no significant improvement in speed or accuracy.

In a study similar to Koeppen's, Pattno (1968) undertook an investigation to determine if speed could be increased by having beginning typists automatize two-letter combinations that were typed rapidly by expert typists and significantly slower by elementary typists as determined from Nellermoe's (1965) analysis. The instructional pattern for both the experimental and control groups was the same except for the first part of the class period which was devoted to the experiment. Routinely, the first six-minutes of each class period were allocated for student warm-up practice. This time was used by the experimental group for practice on "isolettes" ("isolettes" refers to

40 isolated two-letter combinations that were typed rapidly by expert typists but significantly slower by elementary typists). Pattno found that the isolette drills neither improved nor retarded the accuracy of the experimental group. However they served to accelerate significantly the overall typewriting speed of the experimental group.

Several studies were completed on the relationship of different types of practice to production typewriting achievement. Armstrong (1968), in a doctoral study, compared the achievement in production typewriting of students who practiced production work:1) with a minimum goal set and the grade assigned dependent upon the quality of the work produced, 2) with specific goals set for each grade level expressed in terms of mailable words per minute, and 3) with specific goals set for each grade level expressed in terms of work units. The students participating in the study were college students enrolled in Typewriting II and III. Armstrong reported the following findings:

1. The setting of specific quantitative goals was not more effective in the development of production skill than the setting of minimum goals with the emphasis placed on the quality of the work produced.
2. Expressing goals in terms of mailable words per minute was more effective than expressing goals in terms of work units.
3. None of the three approaches employed in the study seemed to have a noticeable effect on straight-copy typewriting skill.

The purpose of a study done by Hamed (1968) was to compare the effectiveness of two methods of developing production typewriting ability—spaced practice versus massed paractice. Two practice schedules of 64 days each were developed for use with two groups of high school students. A control group used a spaced-practice schedule which included four consecutive days of practice on one topic, followed by four days of practice on a different topic. After all four topics—tabulation, manuscripts, business forms, and business letters—had been practiced for four days each, the procedure was repeated three times. The experimental group used a massed-practice schedule which included 16 consecutive days of typing on the same topic. By the end of the study, both groups had typed identical problem material. A series of validated pretests were administered to measure homogeneity of the groups and were repeated as post-tests to compare the groups for significant differences as well as to determine growth in performance and attitude for each group. Hamed reported that there were no significant differences between groups on any of the post-tests. Additional findings, although not significant, reported by Hamed were:

1. The control group made a greater percentage gain than the experimental group on all four 35-minute post-tests; these tests included practiced material.
2. The experimental group scored substantially higher than the control group on the two-hour production post-test; this test included problems different than practice material.
3. Overall attitude improvement favored the experimental group.

4. Experimental high-achieving students outperformed control high-achieving students.

5. There was a pronounced correlation between production achievement and: 1) IQ, 2) straight copy speed, and 3) attitude.

Based on his findings, Hamed suggested that publishers should give careful consideration to the selected benefits of massing all problem work on one topic in the same part of the typewriting textbook.

Gades (1967) studied the effect of short-duration high-speed drill on speed, accuracy, and production rate development in the first year of typewriting. In this study, the experimental group used a high-speed drill procedure for 10 to 20 minutes of each class period. The high-speed drill procedure was composed of six drills adapted from other sources and one developed specifically for this study. The drills used short passages of material designed to force the learner to type at maximum speeds for short periods of time not to exceed one minute. The control group used the standard high-speed and accuracy development procedures presented in current high school textbooks.

Based on his findings, Gades concluded that the procedure using short-duration high-speed drills is a more effective method for building speed and accuracy in the first year of high school typewriting than are the present speed building procedures in most current textbooks; that the high-speed drill procedure is as effective during the second semester of typewriting as it is during the first; that the speed-building program need not necessarily include a gradual increase in the length of timed writings as the year progresses; and that classes using a high-speed drill procedure develop a greater ability to do production typewriting in the first year of high school typewriting than do classes using the present speed-building procedures.

Claudia Young (1967) studied the effect of direct competition in the classroom on achievement in speed and accuracy. Students in the experimental group were assigned seats placing students with similar typing ability next to each other. These pairs of students were encouraged to compete with each other on all work done. Students in the control group were seated randomly. Achievement was measured by five sets of three-minute timed writings which were administered to both groups at 25-day intervals. Young found that: 1) there was no significant difference in the gross words per minute between the two groups on any of the first four timed writings; 2) there was a significant difference between the two groups, in favor of the experimental group, on the final timed writing on gross words per minute; and 3) there was no significant difference in errors committed between the two groups on any of the five timed writings.

Lindsay's (1966) problem was to identify, define, and systematize significant concepts for efficient motor skill development in typewriting by linking learning variables to task analysis on the one hand and to learning theory on the other. Criteria for the psychological relevance of concepts were determined through analysis of: 1) task behaviors, ability factors, and critical problems in typewriting motor skill development; 2) significant

learning variables influencing behavioral change that can be manipulated by the teacher; and 3) valid learning theories appropriate to the specifications of the motor skill process. Typewriting task data were secured through an analysis and synthesis of findings from selected experimental studies in educational, military, and industrial research. Lindsay reported that typewriting motor skill development does not require sequential mastery of certain steps in a hierarchical arrangement. Rather, simpler processes of many interacting cycles are gradually integrated into more complex units, with simultaneous mastery of lower-order and development of higher-order processes. Changes in proportional emphasis on these processes are sufficiently defined, however, for logical deduction of three performance phases: 1) familiarization and response orientation, 2) refinement, and 3) fixation and automation.

Learning theories found to be relevant in Lindsay's study reflect the functional emphasis on learning-by-doing, the stimulus-response concepts of contiguity and reinforcement, and gestalt concepts of perceptual patterning. Application of Lewinian and psychodynamic concepts of stress and other emotions awaits more adequate research findings adaptable to classroom practice.

West (1968) conducted a study to test the hypothesis of increasing dependability of kinesthetic cues as skill is acquired, to estimate the extent to which persons at various levels of typing skill can depend on muscular sensations as an index of correctness of motions, and to estimate the effects of deprivation of vision on typing speed and errors.

Typists participating in the study ranged in typing skill (as measured by gross stroking speed in ordinary copy work under normal conditions) from nine through 109 words per minute. All subjects typed under each of three conditions:

1. Under the conventional and familiar instructions to follow the copy word by word.

2. Under instructions to space once and retype instantly any word thought to have been mistyped, before continuing with the next word.

3. Under the same special instructions as 2, but deprived of visual reference to the typewriter and the typescript.

Findings, as reported by West, follow:

1. The surprisingly low levels of dependable kinesthetic feedback among 100 WPM typists contradicts and depicts as a delusion the common self-report by typists that they "nearly always" know when they make an error because it "feels" wrong.

2. The novice typist knows when he has done something wrong only one-fifth of the time—when he cannot see. His muscular sensations are quite undependable. To insist that he type by touch is to rob him of reinforcement, thereby making learning unnecessarily slow and arduous.

3. No strong tendency for continuous increase in dependable kinesthetic feedback as typing skill increased was found.

4. There is only a modest tendency for increased use of sight and hearing to be accompanied by increased use of kinesthetic cues as a source of feedback.

5. There were no effects of visual deprivation on speed of work.

6. Instructions to retype in the case of error sharply reduced the number of errors; visual deprivation sharply increased them.

West added that the findings of this study confirm the inference that was available more than 30 years ago; namely, that the cardinal assumption underlying the conventional insistence on nonvisual operation at the start of learning to type is devastatingly wrong. Under such conditions: 1) the learner fishes hesitatingly for keys (with adverse affects on high stroking techniques); 2) there are long delays between perceiving the copy and making the stroking response; 3) the learner makes many errors; 4) the learner cannot immediately correct a misstroke (immediate error correction is an important principle during the early learning of any skill); 5) the learner is full of anxieties because nonvisual work is unnatural to and impossible for him; and 6) the learner is denied immediate reinforcement for correct responses.

One investigator (DeLoach, 1968) attempted to determine differences in fine motions affected by physical development in selected girl learners of touch typewriting. A second goal of the investigator was to discover whether less physically mature students increased in ability to type straight copy less rapidly than more physically mature students. Differences in fine motions were sought to indicate the influence of physical development on ability to type by touch and to provide information about typing performance heretofore not available.

Three groups of four subjects selected from third, fifth, and seventh grades were classified according to physical maturity as judged by the X-rays of one hand of each subject; an instructional program was developed, and subjects participated in a 30-lesson course in touch typewriting. Data were gathered through the use of 16 millimeter motion picture film and were analyzed through the use of a special projector and a checklist. Additional data were obtained through the use of one-minute straight copy tests. DeLoach concluded that physical development was not an important factor in the keystroking operation in typing or in typing from straight copy. Least mature subjects (carpal ages 94-114 months) were able to make fine motions and type from straight copy as well as the most mature subjects (carpal ages 138-154 months).

Garry's (1967) problem was to determine whether there were significant changes in error patterns of typists during the second semester of typewriting on the electric typewriter. He administered different five-minute timed writings, each of equivalent syllabic intensity, to students during the twenty-fifth, twenty-eight, thirty-first, and thirty-fourth week of the school year. Twenty-six error categories were established for classification. He concluded that students typed significantly faster during the thirty-fourth week of the school year on the electric typewriter than they did during the twenty-fifth week. They did not, however, type more accurately. The total number

of errors were very stable from test period to test period. The rank order of error categories showed extreme stability indicating that the types of errors the students made on the electric typewriter from test to test were essentially the same.

Thompson (1967) analyzed the typewriting error stroking serial responses—pre-error stroking response and post-error stroking response—to determine the effect of errors on patternism in typewriting. She reported that there was a significant difference between the error patterns and the correct patterns of typists. Both the pre-error stroking serial response and the post-error stroking serial response manifested a longer time in execution than the execution of either the pre-stroking serial responses or the post-stroking serial responses. When the pre-error responses and post-error responses were compared with each other, there was a significant difference for substitution errors and insertion errors but not for omission errors or transposition errors. When the error responses were compared with the correct responses, there was a significant difference for substitution errors, transposition errors, and omissions errors but not for insertion errors. Thompson concluded that more time is involved in the execution of error responses than in the execution of correct responses. The post-error responses consume considerably more time than the pre-error responses.

Wood (1966) compared the pipe-organ method of typewriting figures with the traditional method of typewriting figures to determine which method is more efficient in learning and in actual practice. Wood's findings were: 1) The students in the group taught numbers in the traditional manner showed a greater increase in correct words per minute during the period of three quarters than did the group taught numbers using the pipe-organ method. This increase, however, was not significantly different. 2) The students in the group using the pipe-organ method showed a higher gross stroking speed and more errors than did the traditional group. The high error rate lowered the correct words per minute for the pipe-organ method group.

A presentation of research pertaining to correct words per minute, gross words per minute, and other straight copy scoring methods is presented in the Evaluation section.

McDonough (1966) studied the use of controlled spelling instruction to improve the spelling ability of students enrolled in beginning typewriting classes. Three methods of teaching spelling were used in the study. The no-instruction group received typewriting instruction only. The limited-instruction group had 10 spelling words a day taken from "500 Business Words." The intensive-instruction group used the workbook "Spelling Drills and Exercises Programmed for the Typewriter."

McDonough concluded that: 1) too much time was taken up with the spelling experiment—time that could have been devoted to increasing typewriting skills; 2) despite apparently little difference in increased spelling achievement between the intensive-instruction group and the limited-instruction group, the intensive-instruction group had the use of an excellent learning device in the form of the programmed spelling workbook; 3)

sophomores, in most instances, benefited more from the spelling instruction than did juniors; 4) students in the first quartile of each group usually showed the greatest gain; and 5) there was no apparent difference between the spelling achievement of the boys and girls.

Palmer (1967) determined if students in typing classes can learn the content of short stories when the students type the short stories. Some of the conclusions reported by Palmer were: 1) students can learn from the content of materials they type; 2) students who learn from typing have better retention than those who learn from reading; and 3) students who concentrate on learning the content of the materials being typed gain more skill in typing than do students who disregard the content of practiced materials.

Terrill (1968), in an experimental study, compared the achievement of two classes in composition at the typewriter. Some of the findings and conclusions reported were:

1. Regular compositional practice will not necessarily result in a greater quantity of material composed at the typewriter.
2. A student's typing speed will not significantly affect the quantity of material typed.
3. If beginning typewriting students are taught the skill of composing at the typewriter, the quality of the composition produced will show significant improvement over that produced by students who have not had compositional practice within the classroom.
4. Students will not hesitate to use their ability to compose at the typewriter outside of the classroom if they have been asked to create comparable compositional exercises in class.
5. The intellectual ability of the students learning how to compose at the typewriter will undoubtedly affect their level of achievement.
6. In teaching composition, the teacher should stress the use of the typewriter as a "writing tool" rather than emphasizing the words "composition, essay, theme, or grammar."

A new and very comprehensive typewriting methods textbook was recently authored by West (1969). In this book, West brings to bear on typewriting instruction a substantial body of research of two kinds: 1) research arising from the psychology of learning which leads to fundamental concepts or principles governing skill-acquisition processes; and 2) research concerning typewriting in particular which consists mainly of classroom investigations. For persons interested in research relating to typewriting, a more comprehensive piece of writing cannot be found.

Monograph 117 (Robinson, 1967) is a collection of articles on the teaching of typewriting. The first article is a report of teaching practices and preferences of high school typewriting teachers, based on a national survey during the school year 1964-1965. It might be worthwhile for the classroom teacher to compare some of the teaching practices and preferences listed in this monograph to the research that West (1969) reviews as a way of evaluating typewriting teaching practices and improving such instruction. Each of the other articles in Monograph 117 is a position statement concerned with one or more of the questions asked in the survey; each repre-

sents the point of view of a particular author based on either his experiential or experimental evidence, or both. The major sections of the monograph are: 1) Patterns of Typewriting Instruction, 2) Assuring Keyboard Mastery, 3) Building Basic Typewriting Skills, 4) Developing Problem and Production Skills, and 5) Evaluating Typewriting Performance.

Shorthand-Transcription

Two studies investigated the effect of introducing shorthand theory at a rate of less than one lesson a day. Manwaring's (1965) problem was to determine the effect on shorthand achievement of spending two days per theory lesson as opposed to one day per theory lesson. Achievement was measured by the accuracy with which students transcribed two, three-minute tests dictated at 70 words a minute. Manwaring concluded that teachers may use either instructional schedule without detrimental effect on the achievement of students. Results of her study also indicated that doubling the amount of time spent in teaching the shorthand system itself did not affect the end of the year accomplishment of students of average or lower general scholastic ability.

In a study similar to Manwaring's, Cason (1967) studied the effect on dropout rates and achievement of presenting Gregg shorthand theory at a rate of less than one textbook assignment a day. In the control group, an assignment a day was the set pattern, and the textbook was completed by the end of the first semester. The experimental group covered the first 54 assignments of the text rather than the prescribed 70 lessons by the end of the first semester. (Assignments 1 through 54 present all of the shorthand theory, and assignments 55 through 70 are review lessons.) Throughout the second semester, both groups received identical instruction. At the end of the second semester, identical achievement tests were administered to both groups. The findings indicated that there was no significant difference in the dropout rate or the end-of-year achievement for the two groups.

Pullis (1966) determined the relationships between the student's: 1) ability to write accurate shorthand outlines and his achievement in shorthand dictation, 2) ability to write accurate shorthand outlines and his ability to transcribe the outlines, and 3) ability to transcribe isolated shorthand outlines and his achievement in shorthand dictation. The study was conducted at the college level. A word list test of 200 words, sampled from Silverthorn's business vocabulary word list, was administered to each class at the end of each three-week interval beginning with the ninth week of the semester. Unfamiliar, three-minute, non-previewed dictation tests, ranging from 50-140 words a minute, were given to each class at the end of each week beginning with the twelfth week. Pullis concluded that:

1. Shorthand dictation achievement is significantly related to the student's ability to construct accurate shorthand outlines.
2. Shorthand transcription ability is significantly related to the student's ability to construct accurate shorthand outlines.
3. Shorthand dictation achievement is significantly related to shorthand transcription ability.

4. Though shorthand transcription ability is significantly related to achievement in shorthand dictation, it is the student's ability to construct accurate shorthand outlines which enables him to transcribe the outlines which he has written.

In a study of the relationship between symbol mastery and selected dictation speeds in Gregg shorthand, Goetz (1966) also reported that those students who possessed the highest dictation speeds also attained the highest degree of symbol mastery.

Prince (1967) compared the transcription achievement of students receiving drills on the 500 most frequently used words to students not receiving these drills in beginning shorthand. Two groups of high school students were both taught in the same way, with the exception that during the second semester, the 500 most frequently used words from the Silverthorn list were emphasized in the experimental class in the form of drills given 10 minutes each day, four days a week. Transcription tests, one pretest and two post-tests were administered. Transcripts were checked for: 1) the percent of accuracy, 2) the percent of transcription errors made on the 500 most common words, and 3) the percent of transcription errors made on the other words. Prince found that after the period of emphasis, the group that received the emphasis on the 500 most common words transcribed correctly a greater portion of the dictated material than the control group. These students transcribed a greater portion of the frequently, as well as a greater portion of the infrequently used words than did students in the control group. Errors made on the most frequently, as well as those made on the infrequently used words were fewer for the experimental group than for the control group on both post-tests although the opposite had been true on the pretest.

The effects of immediate versus delayed knowledge of correct response on initial learnings and retention of selected related learnings in transcription classes were investigated by Bose (1966). Twenty-four sets of teaching materials were prepared. Two sets were administered each week for 12 weeks. The items in the experimental and control groups were identical, but the materials differed in form. The materials for the experimental groups were designed to give the students immediate knowledge of the correct answer, whereas the materials for the control groups were designed to give the students delayed knowledge (after all items in a set of teaching materials were completed) of the correct answer. The results indicated that immediate knowledge of correct response had no significant effect on initial learning in beginning transcription, but immediate knowledge of correct response significantly facilitated initial learning in advanced transcription. Bose added that immediate knowledge of correct response appeared to have no significant effect on retention in either beginning or advanced transcription.

Dickinson (1966), in a study of learning theories, investigated whether practice techniques and procedures in shorthand, recommended by authorities in the field of business education, are in accord with theories of learning applicable to practice as advanced by authorities in the field of

psychology. The investigator studied extensively the published materials relating to practice and to the learning of shorthand. The materials examined were the writings of: 1) a selected group of psychologists—Thorndike, Guthrie, Skinner, Hull, Tolman, Koffka, Kohler, Werthermer, and Wheeler; and 2) the inventors of Gregg shorthand—Gregg, Leslie, and Zoubek. The investigation was concerned with: 1) the representative views of psychologists, inventors' comments' and recommendations concerning major practice activities that the inventors have recognized as a part of the learning of shorthand as a skill; and 2) the theoretical implications of the results of a comparison between recommendations in shorthand methodology and indications of the representative views concerning practice. A synthesis of facts and ideas of the materials examined provided information concerning the divergence or uniformity of practice procedures which exist in shorthand instruction as compared with psychologists' views concerning effective practice.

Dickinson reported that the Gregg shorthand inventors, in suggesting techniques and procedures for practice in the building of skill in shorthand, have expressed certain ideas which are substantially in agreement with the principles set forth by psychologists. However, there is disagreement between the inventors and the psychologists on a number of crucial psychological elements. This disagreement is evidenced by the instances of suggestions for shorthand practice which are neither based on nor compatible with a psychological theory. He added that in some cases the inventors have presented materials and argued the psychology behind these materials even though there was nothing in the psychological literature examined to provide substantiation for their argument. Dickinson concluded that authority recommended practice techniques and procedures in shorthand are not uniformly in accord with theories of learning applicable to practice as advanced by psychologists.

Gregory (1968) studied two methods of completing shorthand homework. One group of students used the transcript method, which involved the typing of a transcript from the shorthand plates in the textbook. This copy was triple spaced so that students would have room to write shorthand between each line of the transcript while they read from print. The second group used the traditional method which involved the copying of shorthand homework directly from the textbook into the students' notebooks. Based on the findings, the investigator concluded that: 1) no significant difference existed between the performance of students who did their homework by the transcript method and those who did their homework by the traditional method in memorizing brief forms; 2) no significant difference existed between the performance of students who did their homework by the transcript method and those who did their homework by the traditional method in applying the theory of shorthand to the construction of outlines from dictation; and 3) the students who did their homework by the transcript method transcribed their own notes on the typewriter more accurately than students who did their homework by the traditional method.

Three studies completed during the period, 1966-1968, investigated new-matter dictation.

Persing (1966) attempted to determine whether new-material dictation should be introduced early or delayed until the theory has been completed. Two groups were taught and tested in identical fashion except for the early and combined training in new-matter dictation for one of the groups. She reported that there was no statistically significant difference in achievement in theory, familiar-matter dictation, and new-matter dictation between the two groups.

In a study done at the college level, McKenna (1966) taught one section of shorthand students through a language arts approach with no writing until the students had completed three chapters of the textbook. Students were not informed that there were rules governing the construction of shorthand outlines, and no new-matter dictation was given until all shorthand theory was completed. The other section was taught through a science-type approach with the students writing after the completion of the first chapter in the textbook. Rules for outline construction were presented after the students were familiar with the alphabet and joinings, and new-matter dictation began in the eighth class period. Based on her findings, McKenna reached the following conclusions:

1. The early introduction of new-matter dictation does not result in an increase nor does it retard students in the ability to take and transcribe new-matter dictation.
2. The study provides no evidence to suggest either postponed benefits or postponed handicaps due to the early introduction of new-matter dictation.

Baird (1967), in a study done at the high school level, introduced regular and frequent dictation of unpracticed material beginning with the twenty-fifth lesson to determine if early introduction of new-matter dictation would result in students reaching a dictation speed of 60 words a minute with at least 95 percent accuracy in less time than if dictation of unpracticed material was delayed until all 53 theory lessons had been presented.

Baird's conclusions substantiate those of the two preceding studies. He reported:

1. The early introduction of unpracticed dictation material in beginning high school shorthand classes did not reduce the time required to transcribe successfully unpracticed material dictated at 60 words a minute for three minutes.
2. The early introduction of unpracticed dictation material in beginning high school shorthand classes had no discernible adverse effect on student achievement.
3. There was no evidence to justify early introduction of new-matter dictation before completion of the theory in the beginning high school shorthand class.

In two similar studies somewhat conflicting findings were reported regarding the application of the micromolar behavior theory to dictation skill building in shorthand.

Sloan (1967), at the high school level, established an experimental class in which material was dictated at 100 words per minute. In the control

group, the material was dictated at speeds ordered from low-to-high-to-low. The 12-week investigation included the first 56 lessons. Four interim tests of new material were administered during the study. In the control group, the first test was dictated at 50 words per minute, the second at 60 words per minute, the third at 70 words per minute, and the fourth at 80 words per minute. The same tests were dictated at 100 words per minute in the experimental group. At the conclusion of the study, six three-minute final tests of new material were dictated to all students at 60, 70, 80, 90, 100, and 110 words per minute. Sloan found: 1) a significant difference on the first three tests favoring the control group, 2) no difference between the treatment means on the fourth test, and 3) no significant difference between the mean scores of the students receiving the experimental and traditional treatments on the final test.

In a similar study done at the college level, Boss (1967) found that the experimental group (micromolar approach) excelled over the control group on the first two interim tests, but the control group was superior throughout the remainder of the experimental period.

Boss concluded that the experimental group may have equalled or surpassed the achievement of the control group had the experiment been continued for a full academic year. This was based on the fact that although no growth in achievement was evidenced by the control group during the last two weeks of the experiment, the experimental group showed continued growth. Because the traditional dictation method was not found to be superior to the 100 words per minute dictation method on the final tests, Sloan (1967) recommended a study for a full year using the application of the micromolar theory.

Numerous studies have been undertaken to investigate achievement in transcription speed and accuracy.

Cannon (1966) compared the transcription speed and accuracy of advanced shorthand students who preread their shorthand notes before transcribing them with the transcription speed and accuracy of advanced students who did not preread their shorthand notes prior to transcription. He reported the following findings:

1. Students in the non-prereading group prepared better transcripts in significantly less time than did the students who preread their shorthand notes prior to typing the final copy.
2. There was no significant difference between the transcription accuracy of students in the two groups.
3. The error analysis gave no indication that one group committed one kind of error more or less frequently than did the other group.
4. The prereading group produced a significantly higher number of mailable letters than the group which did not preread.

The major problem of a study completed by Tronsue (1968) was to determine and evaluate the interrelationships of transcription speed and: 1) type of transcription—immediate or delayed; 2) rate of transcription—slow or fast; 3) rate of dictation—slow or fast; and 4) style of writing—

ambiguous or clear. A subsidiary problem was to determine and evaluate interrelationships of transcription speed and: 1) straight-copy tupewriting speed; 2) score on ITED Test No. 3—Correctness and Appropriateness of Expressions; and 3) score on ITED Test No. 8—General Vocabulary.

Tronsue reported that the findings of her study supported the following conclusions:

1. There is a differential effect on transcription speed for the two styles of writing, favoring the clear.
2. There is a positive zero order relationship between transcription speed and each of the independent variables: a) straight-copy typewriting test, b) score on ITED Test No. 3, and c) score on ITED Test No. 8.
3. The relevant variables—straight-copy typewriting speed and score on ITED Test No. 3—operate more effectively in conjunction with one another than in isolation.
4. When relevant variables are controlled, there are strong and definite interaction effects on transcription speed for type of transcription by rate of transcription, type of transcription by rate of dictation, and rate of transcription by rate of dictation.

Bolan (1967) studied the relationship between the students' knowledge of selected grammatical and English composition factors and the application of that knowledge in transcribing from shorthand dictation. Major findings, as reported by Bolan, were:

1. A significant relationship was found between the students' knowledge of spelling, punctuation, capitalization, and grammatical usage and the application of that knowledge in transcribing from shorthand dictation.
2. A significant relationship was not found between the students' knowledge of syllabication, writing of numerals, sentence structure, and paragraphing and the application of that knowledge in transcribing from shorthand dictation.
3. Personal characteristics, scholastic achievement, shorthand-dictation rate, years of typewriting instruction, and curriculum pursued did not relate to the students' application of their knowledge of the English factors in the shorthand transcript.

In an attempt to determine the relationship of transcription errors to shorthand errors and the implications of such findings to the methodology of shorthand and transcription instruction, Iannizzi (1967) studied transcription and shorthand errors made by writers of Diamond Jubilee Gregg Shorthand and Gregg Shorthand Simplified in elementary and advanced shorthand courses at the high school level.

Iannizzi's findings indicated that a moderate to high correlation existed between errors in shorthand and errors in transcription at both levels for both versions of Gregg shorthand studied. She drew the following conclusions:

1. Errors in Diamond Jubilee Gregg Shorthand and Gregg Shorthand Simplified written by students in elementary and advanced classes had a significant effect upon the accuracy of the transcripts produced.

2. There was a relationship between errors in elementary classes and errors in advanced classes.

3. Students in Diamond Jubilee Shorthand classes appeared to be slightly less accurate than students in Gregg Shorthand Simplified classes.

4. Substituted words were the most common transcription errors; brief forms and brief form derivatives were the most common shorthand errors.

In reference to the first finding above, Iannizzi added that accuracy for the sake of accuracy alone should not be stressed since 50 to 55 percent of transcription errors were from correct shorthand outlines and over 80 percent of incorrectly written notes were transcribed correctly.

Dry (1967) made a comparison of the memory load in the Simplified and Diamond Jubilee systems of Gregg shorthand. The words used for her analysis were the first 4,949 words appearing in *The Basic Vocabulary of Written Business Communications* by Silverthorn (1955).

Dry reported that there is a reduction in the memory load required to write Silverthorn's first 4,949 words in Diamond Jubilee, Gregg Shorthand. Memorized forms—brief forms, brief form derivatives, abbreviated forms, abbreviated form derivatives, prefixes, suffixes—as well as rules and exceptions are held to a minimum in Diamond Jubilee Shorthand. More words in Diamond Jubilee are written by simpler, fuller, and more exact shorthand forms than in Simplified Gregg Shorthand. These outlines should be retained by the student longer and should aid him to transcribe more accurately.

Box (1967) designed an experimental study to determine the feasibility of using an objective format for scoring three-minute dictation tests in Gregg shorthand classes at speeds of 60, 80, and 100 words a minute and to determine whether teacher or pupil time could be saved by the objective method of transcription.

Partial transcripts for the objective tests were patterned after the form used by the United States Civil Serivce Commission for testing potential stenographers. Numbered blanks were left for omitted words, and students were provided with an alphabetical list of possible word choices for each test. Box found that the average teacher scoring time for the objective test format was less than that for the verbatim scoring; however, the student transcription process was more time consuming by the objective method.

Stoddard (1967) investigated students' terminal achievement on the National Business Entrance Test for Stenographers after one semester using three different methods of teaching intermediate college shorthand. The three methods included: 1) a major emphasis on dictation with an introduction to transcription in longhand, 2) a major emphasis on dictation with an introduction to transcription using typewriters, and 3) a major emphasis on dictation with an introduction to transcription using typewriters and with all classroom instruction given through the medium of multiple-channel tape recordings. Stoddard's major conclusion was that the effects of the three instructional methods on student shorthand achievement produced no significant differences among group means.

Methods of Teaching Shorthand (Russon, 1968) is a rather comprehensive review of the procedures of teaching shorthand and transcription. Information covered by Russon includes:

1. History of Shorthand
2. Objectives of Shorthand Instruction
3. Approaches to the Teaching of Shorthand
4. Lesson Plans in Shorthand
5. Skill-Building through Shorthand Dictation
6. Teaching Transcription
7. Testing in Shorthand and Transcription
8. Measurement and Grading in Shorthand.

Business Mathematics

A study by Oravetz (1966) evaluated the effectiveness of two experimental daily drill patterns in business mathematics in improving the basic mathematical skills and problem-solving abilities of business mathematics students in college-level work. Two experimental daily drill patterns were used in business mathematics instruction: 1) use of a tachistoscopic-type device (The Math Builder, developed by the Educational Development Laboratories) which visually paced the students during the period of drill; and 2) use of a prepared series of audio-oral rapid mental calculation exercises. The two drill patterns were presented to the experimental groups for 10- to 15-minute periods at the start of each class session. The control groups did not participate in any drill at the start of their period of instruction. Oravetz concluded that a daily drill pattern in college-level business mathematics courses using either a tachistoscopic-type device which visually paces the students during the period of drill or using a prepared series of audio-oral rapid mental calculation exercises appeared to improve the basic mathematical skills and problem-solving abilities of business mathematics students in college-level work.

Business Machines

Corgan (1966) compared the rotation method and the similar processes method in teaching business calculating machines at the college level. She concluded that somewhat better results on proficiency tests can be expected by a group using the rotation plan, because these students work on only one type of machine at a time. However, in a final examination, neither group seemed to excel over the other. She added that students instructed by the rotation method may be expected to do slightly better in a situation in which there is time to regain lost skills before their final examination. If final examinations are not preceded by such a time period, it is questionable that students on the rotation method could do as well. Corgan suggested that a combination of the best elements of the rotation and similar processes methods may produce the most effective learning and teaching environment.

Holt (1967) studied the use of business mathematics problems in teaching business machines at the secondary level as compared with the traditional use of skill problems.

In Holt's study, one group solved skill development problems for the entire semester while the other group spent one week out of every three solving instructor-prepared, business mathematics problems. Holt reported that while the teacher-prepared business problems, as used in the study, were of no significant value in developing skill on the ten-key adding-listing-machine, the teacher-prepared business mathematics problems were of significant value in developing skill on the rotary and printing calculators.

Chan (1966) studied the effect of mathematics lectures on the terminal achievement of college business machines students. He found that lectures did not significantly improve the students' terminal achievement in machine operation. The investigator added, however, that the addition of mathematics lectures consistently resulted in better performance in the ability to solve business mathematics problems.

Schultz (1967) studied the teaching of spelling in the office practice class. He administered to a control group a list of words each week followed by a formal test near the end of that week. The experimental group was subjected to the same words in their daily work through the devices of sentences, word hyphenation, warm-up exercises, spelling contests, and class discussion. He found no significant spelling improvement associated with either technique of presentation.

Bookkeeping / Accounting

There is a distinct lack of research completed in the area of bookkeeping methods. Most of the studies reported have dealt with the use being made of bookkeepong knowledge by students who have completed bookkeeping courses.

In one study, however, it was concluded that the "whole-method" of learning should be used continuously throughout the course. The "whole" concept of teaching bookkeeping means collecting and sorting information, proving the summary to be accurate, and then making a presentation of the facts to be interpreted and used in managing the business. This concept is most valuable in adapting one's bookkeeping knowledge to data processing and statistical methods (W. J. Wagoner, 1968).

STUDENT PERSONNEL SERVICES

Prognostic Devices and Testing

Varah (1966) investigated the value of the Michigan M-Scales (a test of academic motivation) for predicting achievement of eleventh-grade girls in the first and second semester of Gregg shorthand when used individually or in combination with the total score or a subscore of an estimate of mental ability. Varah reported that academic motivation as measured by the Michigan M-Scale is a learning factor in first semester Gregg shorthand but is not a learning factor in the second semester. The Michigan M-Scales when used in combination with an estimate of mental ability significantly in-

creased precision in predicting the achievement of eleventh-grade girls in first semester shorthand. The Word Rating List, a subtest of the Michigan M-Scales, was found to be a consistently significant predictor of shorthand achievement for both the first and second semesters of Gregg shorthand. Varah concluded that the best single predictors for first semester Gregg shorthand were: 1) grade-point average, 2) ninth-grade English grades, 3) tenth-grade English grades, and 4) estimate of mental ability. The best single predictors for second semester Gregg shorthand were: 1) grade achieved in Shorthand I, 2) grade-point average, 3) tenth-grade English grades, and 4) mental ability.

Hall (1966), in a study of prognostic devices in shorthand, tried to determine if the Iowa Tests of Educational Development (ITED) Test No. 3, "Correctness of Expression," and Test No. 8, "Vocabulary," would show a predictive relationship to final grades for Shorthand I classes. Hall found a high relationship between the ITED Test No. 8, "Vocabulary," and Shorthand I final grades. The relationship between ITED Test No. 3, "Correctness of Expression," and Shorthand I final grades did not reveal as high a relationship as did the "Vocabulary" test, but it did show merit as a predictor for success in Shorthand I classes.

Freiberg (1968) determined the predictive usefulness of a raw score of 270 attained on the ERC Stenographic Aptitude Test in predicting shorthand success during the first year of shorthand. Also, Frieberg investigated the use of an IQ (Henmon-Nelson) score to predict success or failure in the first year of shorthand. He found that using a 270 raw score on the ERC Stenographic Aptitude Test as a division point to predict success or failure in shorthand was not a valid practice. He added that an IQ score of 110 or above could be used as a point of predicting shorthand success. Freiberg indicated that prospective students with an IQ of less than 110 should be advised that their chances for success in shorthand are not as great as for those students with a higher IQ.

In a study somewhat different from those discussed previously, Wien (1966) attempted to discover which factors or combination of factors are most useful in predicting a successful or unsuccessful transcriber in terms of the quality of transcript. Wien reported that her findings indicated that three of the best indicators of transcription success are those readily available to guidance and business personnel—Shorthand I grades, shorthand speed records, and Typewriting II grades.

Gilsdorf (1968) undertook an investigation to determine if there are any valid criteria with which one can predict success in machine shorthand. Factors investigated included high school GPA, IQ, subjects taken in high school (Gregg shorthand, typewriting, foreign language, English), and age. The study showed that high school GPA is a significant factor in predicting the success of machine shorthand students. Gilsdorf added that since there was a high correlation between high school GPA and English grade, the English grade could be used to predict potential success on the Stenograph if GPA was not available. The other factors investigated showed a low correlation and, therefore, should not be used for predictive purposes.

Karp (1966) critically analyzed the aptitudes, abilities, and high school class rank of private business school students and studied the relationship between the selected prognostic measures and the academic success of first-year private business school students. The most important academic predictor found in the study was high school rank. The next two most important predictors were verbal reasoning and clerical speed and accuracy.

Rice (1968) determined the correlation coefficient of scores on the American College Test (ACT) and year-end grade-point averages of first-year students in the business department of the technical division of the EAU Claire Vocational, Technical, and Adult School. The ACT score for the composite group of business students was significant (0.1 level) in predicting success in achieving a grade-point average of 2.0 or above. Rice added, however, that although the ACT scores were useful for indicating group success, the correlations were not high enough to make individual predictions. Therefore, the ACT score should be used with caution in counseling individuals.

Kollatz (1968) investigated the use of a student's reading and mathematical ability (as determined by the Sequential Tests of Educational Progress) and his Henmon-Nelson percentile score in predicting his potential success in a high school bookkeeping course. She found that none of the correlation coefficients between reading, math, or intelligence percentile scores, and scores on eight bookkeeping tests were sufficiently high to justify the use of any single test score as an indicator of future success in the field of bookkeeping.

Juliar (1967) studied arithmetic ability, as measured by the *AMS Arithmetic Test* and the *Clapp-Young Standardized Arithmetic Test,* as a predictor of achievement in beginning bookkeeping. Juliar found that neither of the tests could be used as a predictive measure, although these tests could be used as a means of determining individual differences in arithmetic abilities.

Gregg (1967) tried to determine whether Kuhlman-Anderson Intelligence Test scores, Iowa Social Studies Reading Test scores, grade-point averages, and motivation rating scores were significantly related to student straight-copy typewriting speed and error rate in beginning typewriting classes. He found that the only significant predictor of straight-copy typewriting speed was the student's IQ score. Reading scores, IQ scores, motivation ratings, and grade-point averages were not significant in predicting error rate.

One of the conclusions reached by Chan (1966) in a study mentioned previously was: "Since the basic math pretest had a positive predictive value, it may be used in predicting students' success in achieving a passing grade in the business machines class."

Guidance and Occupational Information

Loosle (1967) ascertained: 1) the experience and training of high school counselors and pupil personnel directors in the State of Utah in order to determine their orientation toward vocational education, and 2) the voca-

tional education programs now offered in the high schools of Utah to determine if Utah schools are meeting the needs of vocational education. Conclusions, relevant to this report, drawn by Loosle were: 1) the university training of high school counselors and pupil personnel directors was in academic areas; 2) most counselors and pupil personnel directors had work experience in agriculture and business, but the majority did not have work experience in other areas of work; 3) most counselors felt their university training had adequately prepared them to counsel high school students in college preparatory programs, but had not adequately prepared them to counsel students in vocational education programs; 4) counselors and pupil personnel directors were generally not utilizing available occupational material; 5) pupil personnel directors were not utilizing faculty meetings to the extent they could be used as a medium for emphasizing vocational education; and 6) high schools in Utah are not meeting the needs of industry in preparing students for those occupations in which most positions will become available in the near future.

A similar study was undertaken by Hyde (1968), who attempted to determine whether school counselors have the degree of favorableness toward post-secondary vocational and technical education needed to direct students successfully into that form of education. He also tried to identify factors from counselors' backgrounds that were related to their perceptions of post-secondary vocational and technical education. The data for this study were collected by a mail survey instrument which contained a Likert-type attitude scale, a test of knowledge of post-secondary occupational education, and questions to secure demographic data about the counselors.

Population for the study included all Colorado school counselors who were employed in high schools and junior-senior high schools and who devoted at least one-half of their time to counseling. Conclusions reached by Hyde were:

1. School counselors in Colorado did not have as favorable perceptions of post-secondary occupational education as they needed to direct students properly into post-secondary occupational education.

2. The favorable perceptions of post-secondary occupational education held by Colorado school counselors were directly related to the counselors' knowledge of post-secondary occupational education.

3. Study in subject matter areas which were closely associated with occupational education improved the counselor's perception of post-secondary occupational education.

There appears to be a real need for increased emphasis on career counseling at the secondary school level.

Both office occupations and distributive occupations have unlimited possibilities for appealing to many different kinds of occupational interests and abilities. In both fields the diversity of occupations and the different types of work environments in which the occupations are found offer a tremendous variety of career opportunities. Unfortunately, students have

very limited concepts of occupations in these fields because school experiences and home life have been too far removed from the world of work (Klaurens, 1970).

Others (Tennyson, 1968; Phipps and Evans, 1968) have identified the need for "creating curriculum materials related to career planning."

One study of particular interest to business educators was conducted by Darcy and Powell (1968) in which the curriculum was developed on the assumption that:

"Young people can do a better job of preparing for the future—for full participation in the economic life of our nation—if they are given an opportunity to learn more about the economy, its changing technology, and the increasing importance that human resources will have in the future."

As a result of this assumption, an attempt was made, through a set of instructional materials: to help "students develop an understanding of the economic process and the role of work in the life of man; and, further, by explaining how young people can enhance their future employability, productivity, earnings, and work satisfaction by investing in the development of their own knowledge, skills, motivation, and behavior patterns" (Darcy and Powell, 1968).

In an effort to overcome weaknesses in the vocational guidance program, Johnson (1968) planned, developed, and administered the vocational guidance phase of an interdisciplinary program that combined English, social studies, and vocational guidance for twelfth-year non-college bound students. Forty students met for two periods each day with an English teacher, a social studies teacher, and a guidance counselor. The students earned their twelfth-year credits in English and social studies in the program. The three members of the team met throughout the course to plan classroom activities that would coordinate English and social studies with vocational guidance.

The final evaluation by students showed that a majority felt that they had increased their knowledge of their vocational aptitudes and interests, of job opportunities for which they had the aptitudes and skills, of training requirements for the kinds of jobs in which they were interested, and of what they might do after high school. A majority of the students felt that the course had been more valuable to them than previous English and social studies courses that they had taken. A majority of the parents said they felt the class was better than English and social studies classes that their children had had in previous years, that they were glad their children were in the program, that they sensed that their children had enjoyed school more than in previous years because of the program, and they thought the course had done an effective job of preparing their children for life after graduation.

The purposes of a study undertaken by Bumiller (1966) were: 1) to report on Project Notify, a pilot program, conducted through San Bernadino Valley College, designed to provide needed occupational information to youth via television; 2) to evaluate the effectiveness of Project Notify as a

means of disseminating occupational guidance information to high school students; and 3) to seek a recommended means for effective utilization of Project Notify tapes as a classroom tool for occupational guidance programs. The population of the study consisted of the twelfth-grade students of eight senior high schools in the San Bernadino Valley College district. Counselors from the eight high schools selected, on a random basis, 25 students to view each of the television tapes. Two tapes were shown the first week, two the second week, and three the last week. Tapes were broadcast simultaneously to the eight high schools. Thirty minutes were required for the actual viewing, with approximately 20 minutes for the completion of questionnaires. Three questionnaires were prepared for the study. One questionnaire obtained responses from students immediately after they viewed the video tapes; the reactions and responses of high school counselors were recorded on a second questionnaire, and a third questionnaire was completed by a research interviewer at the time he interviewed selected students, four to six weeks following the viewing of the tapes. The television programs were intended to be of particular value to disadvantaged and minority youngsters. The tapes showed a young worker as he began his career in the occupational family at an entrance level position. Through his contact with other employees representing various employment levels, and by his own promotion, the career-ladder progressions were illustrated. The worker continued his education in the evening, and through motivation and determination, progressed at a faster rate than an employee who lacked these qualities. Tapes were presented pertaining to each of the following occupational areas: Secretarial, Food Retailing, Department Store Retailing, Automotive Repair, Lodging and Food Service, Financial Institutions, and Law Enforcement. Bumiller concluded that: 1) while the programs were effective as a source of general occupational information, they were not of special value to disadvantaged or minority students; 2) contrary to the view of the counselors, students were not particularly motivated to seek additional occupational guidance information, although they were impressed with the importance of continuing their education; and 3) from the student point of view, television is an effective medium for the presentation of occupational guidance information.

The purpose of an investigation by Roberts (1968) was to study the dissemination of occupational information by classroom teachers through group instruction. Data were gathered through questionnaires, interviews with classroom teachers, and classroom observations. Only a few of the many conclusions drawn by Roberts are reported here. He indicated that: 1) the degree of attention paid to occupational information varied according to the individual teacher's concept of the importance of this area, rather than any preconceived standards established by the various syllabi. Teachers instructing similar subjects reported little consistency in the degree of attention paid to this area; 2) the teachers of the practical arts subjects, e.g., industrial arts, home economics, business education, etc., generally incorporated occupational information into their instruction with more regularity than teachers of the academic areas; 3) reasons given by teachers for not offering instruction in occupational information were an insufficient

amount of teaching time, a lack of information with respect to available resource material, and a lack of flexibility within the school program; and 4) few classroom teachers have been trained in the tools and techniques of occupational information through formal course work.

The major purpose of a study completed by Dunn (1967) was to identify the use, value, and effect of data processing on the guidance programs of secondary schools. The first step in his study was to establish the functions of data processing in the guidance programs of secondary schools. These functions included data processing as an aid to: 1) counseling, 2) classroom teaching, 3) curriculum development, 4) communication, 5) schedule preparation, 6) research, and 7) recordkeeping. Based on the data gathered, Dunn concluded:

1. Data processing was not being used extensively in the guidance programs of the participating schools.

2. Data processing apparently has more value in the guidance programs of secondary schools than one might conclude from the limited use that has been made of it in participating schools. This conclusion is based on the opinions of the participating counselors regarding the value of data processing as a guidance tool.

3. Data processing has had little effect on the guidance programs of the participating schools, either positive or negative.

4. In the opinion of the participating counselors, the use of data processing should be expanded in the guidance program of secondary schools, especially in the completion of clerical tasks, as an aid to classroom teaching, and as an aid to research.

Jerrold Hanson (1967) attempted to assess the effectiveness of vocational-educational counseling with high school boys. Students were identified as extreme overshooters (aspiring to occupations probably beyond their capabilities) and extreme undershooters (strong probability that they could succeed at higher level occupations). The 30 most extreme undershooters and 30 most extreme overshooters were randomly assigned to treatment groups. The treatments were individual counseling, group counseling, and no counseling.

Conclusions based on the investigation were that individual counseling with vocationally unrealistic high school boys and group counseling with undershooters did not result in statistically significant improvement. However, group counseling with overshooters did result in marked improvement in realism.

Laney (1967) investigated the specific role of guidance counselors in the area of business education. She found that more than one person was responsible for guidance and placement of business students. The principal, guidance counselor, and business teacher, in that order, were the ones most frequently responsible for student placement. Student choice was indicated by the majority of junior high school counselors as the criteria for placing students in the business curriculum. The following were also checked by

respondents as the method of screening students for placement in business: English grades, intelligence tests, scholarstic records, aptitude tests, teachers' estimates, and parental requests.

Churchill (1966) developed *Office Careers,* a printed brochure on office occupations for young women. He also reviewed current media used in the dissemination of occupational guidance in business education. He reported that there is a limited amount of related literature available on the actual practices *employed* by teachers for implementing vocational guidance in their classroom activities. Based on his work, he made the following recommendations: 1) a study should be made to determine what media are used by classroom teachers in business education for disseminating vocational guidance information in addition to information contained in the classroom textbooks; 2) a review of office occupations should be made to exclude or eliminate from printed brochures careers for women that are diminishing in need and popularity and to include new jobs in the office; and 3) a similar booklet dealing with office occupations for young men should be considered.

Costos (1967) investigated the college acceptability of high school graduates who had taken business courses in their high school programs. He also obtained the views of directors of admissions and registrars in midwest colleges and universities in accepting these graduates for college admissions.

Costos reported the following findings:

1. The largest percentage of institutions required the prospective applicant to have at least 12 units in academic subjects before he would be considered for admission to a college.

2. The majority of the schools surveyed also required that the student be in at least the upper half of his class and maintain a minimum C grade average.

3. It was indicated that an excess of business courses in high school would, to some extent, impede the applicant from attending the college of his choice.

4. Most schools required the applicant to take an entrance examination; the most frequently administered being the College Boards.

Although completed earlier than the Costos study, a doctor's thesis by Young (1966) indicates findings quite different. The purpose of Young's study was to determine if students who plan to enter colleges and universities can elect five or more business and/or industrial courses in high school without fear of being inadequately prepared for academic studies in college. One hundred thirty pairs of students were matched according to IQ, high school academic grade-point average, age, sex, race, type of neighborhood, high school, high school graduation year, and college or university attended. The mean number of business and/or industrial courses elected in high school by the "five or more business and/or industrial" electors was 7.89 and that of their matches .88. After one year of college, the academic grade-point averages of both groups were computed. It was

found that the "five or more" electors had achieved a mean grade-point average which was .07 higher than that of their matches. This difference was not statistically significant. Both groups performed equally well in college academic achievement. Young recommended that college admissions requirements be changed to accept sequences in business and industrial fields equally with academic sequences in high school.

After conducting a follow-up study of business education proficiency card holders who had graduated from Nathan Hale High School, Seattle, Washington, Donald Smith (1968) concluded that it is possible for students of Nathan Hale High School to earn one or more business education proficiency cards and at the same time take the required college entrance courses.

Findings such as those reported by Costos (1967) and Donald Smith (1968) should be brought to the attention of guidance counselors and school administrators. These people should be made aware that students enrolled in business classes are not all low ability students and that despite completion of several "nonacademic" courses, students can be quite successful in college.

Fluke (1968) and John Smith (1968) investigated the articulation of high school bookkeeping and elementary college accounting. Fluke (1968) reported that at the two universities she studied students who had taken bookkeeping in high school received a larger percentage of A and B grades in the first-semester college accounting course than students who had not taken bookkeeping in high school. She added, however, that students did not feel that a student with one year of high school bookkeeping could enter the second semester of college accounting without taking the first-semester college accounting.

John Smith (1968) conducted two classroom instructional experiments in college accounting. In one, he compared the achievement of those students who had studied high school bookkeeping and those who had not. In the other, he determined whether or not the students who had studied high school bookkeeping could successfully complete college elementary accounting in fewer class hours than were required for those students who had not.

The findings, based solely on the groups studied, confirmed the assertion that there is a significant difference between the achievement in college elementary accounting of students who have studied high school bookkeeping and those who have not. The findings also confirm the assertion that the student who had studied bookkeeping can successfully complete college elementary accounting is substantially less time than the time required for those who have not studied it.

Forsberg (1968) found that one year of high school shorthand offers only slightly better preparation than one semester of college shorthand for intermediate college shorthand. Students who have completed a year of high school beginning shorthand tend to write slightly faster at the conclusion of intermediate shorthand, but transcribe with approximately equal proficiency than those who have completed one semester of college shorthand.

Follow-up Studies

Cook and Shapiro (1968) had as the purposes of their study to:

1. Identify successful secretaries, i.e., those who have adapted successfully to the secretarial role.
2. Analyze which variables contributed to or were associated with secretarial success.
3. Identify factors relevant to the education and training of secretaries.

A single public utility was selected by the investigators as being the only practical source available for data collection. This could be considered a major weakness in the study. Primary data were secured from the employees of 67 work groups containing a total of 326 employees. These employees were: 149 secretaries, 132 supervisors, and 45 other clerical employees. Three instruments were designed specifically for this study and were field tested and revised before interviewing began. Data were collected by trained, paid, professional interviewers. The investigators reported findings and conclusions too numerous to review here. A few of the conclusions are, however, reported below:

1. Job satisfaction does not affect a secretary's success. There were no significant differences between secretarial success and *general satisfaction* toward the secretarial profession.
2. Work experience, either as a secretary or in work experience other than as a secretary, had no significant effect on secretarial performance.
3. The work situation, rather than personality traits, is a major determiner of the degree of success. It does not always appear that emphasis upon personality development is the most effective method of preparing young people to perform adequately in job situations. Generalized attitudes and traits, such as being energetic, decisiveness, flexibility, initiative, confidence, organization, and accuracy are the traits of a highly successful secretary.
4. Secretaries who majored in business in high school were significantly more successful than secretaries who had not, although neither the number of typing courses nor the number of semesters of business courses taken in high school significantly affected the success rating of the secretaries.

Fairbank (1967) attempted to determine what kinds and amounts of business, educational, and personal uses had been made of bookkeeping skills and knowledges of former students who had studied New York State syllabus-outlined courses in bookkeeping. This was one of the most extensive bookkeeping studies undertaken. Some of the conclusions drawn by Fairbank were:

1. Present syllabus-outlined courses in bookkeeping have provided, in their overall organization and content, effective vocational bookkeeping preparation for many students.
2. Despite the overall vocational utility of the bookkeeping courses, many syllabus items are rarely used on the job.

3. Both males and females study bookkeeping, and both sexes subsequently use their bookkeeping in office-store work. Females are more frequently employed as bookkeepers than males, but significant numbers of males either go directly into bookkeeping or pursue post-high school study of bookkeeping and then are employed as bookkeepers.

4. The syllabus should emphasize the preparation of workers for full-time rather than part-time bookkeeping work.

5. Greater emphasis within the syllabus should be given to bookkeeping for service businesses than to bookkeeping for merchandising, manufacturing, or other types of businesses.

6. Syllabus-outlined courses have not been very effective for the personal use of the graduates.

Stauske (1966) determined whether the one-year bookkeeping courses taught in the secondary schools meet the required needs of the students who enter the business world. He reported that the bookkeeping course, as taught at Marathon High School, generally meets the needs of those who enter employment in bookkeeping or clerical skills. He added that, although many of the high school bookkeeping students will be employed in office occupations, few of them will be engaged in work of a bookkeeping nature. Also, high school bookkeeping appears to provide vocational guidance for undecided high school students since 61.9 percent sought additional accounting knowledge in post-high school courses.

Robertson (1965) was interested in whether there were important differences between a group of employees who had participated in a secondary school cooperative education program and a group who had not participated in such a program. Data were compiled from: 1) a questionnaire and job-satisfaction scale completed by employees, 2) a job-rating scale completed by employers, and 3) high school records.

Robertson reported that no significant differences existed between the two groups when compared on the following job factors: 1) job satisfaction, 2) job performance as determined by employers' ratings, 3) types of duties performed on the job, 4) supervisory responsibilities, 5) salary earned, 6) size or types of firms for which employees worked, 7) methods by which employees found employment, 8) job stability as determined by number of employers for whom employees had worked, 9) reasons why employees changed jobs, 10) job aspirations, and 11) expected persistance in present line of work.

He added that the cooperative education program was beneficial to those employees who wanted to begin working immediately after graduation from high school. The work phase of cooperative education was not considered by the former participants to be primarily a learning experience.

As evidenced by listings in the *National Business Education Quarterly* and the *Business Education Index,* numerous follow-up studies of local interest are completed each year. Although these studies are valuable for curriculum revision and program changes, no effort has been made to review these studies in this report.

An interesting study was undertaken by Shire (1967). He investigated institutionalized emotionally disturbed adolescents to see if they could be taught to perform routine office tasks. The case study method was used to evaluate the students during the nine-week study. Twenty-two students were enrolled in the office practice classes. Three classes were formed and met in two-hour blocks, five days each working week. The students were grouped as homogeneously as possible to grade level and emotional stability. The selection criteria for the office program required that the student should be able to read, calculate, and comprehend on the seventh-grade level, and be sufficiently stable emotionally to benefit from the instruction. Materials used were conventional textbooks, modified and supplemented to fit the program. The units taught were typing, filing, record-keeping, duplicating, and communications. Daily records were kept for each student indicating his reactions to the daily class work and his progress in learning. No attempt was made to show change in emotional adjustment by the adolescent. Shire reported numerous findings which, in a case study approach, are difficult to summarize. He did report, however, that seven students were able to complete general assignments and work with minimal supervision. Thirteen students had to be closely supervised in all assignments attempted. Two students were in the office practice classes for only three weeks. They escaped from the hospital and were not observed further. All of the students demanded constant reassurance and attention from the instructor. The student's average attention span was not over 30 minutes at any given time. All instructions had to be carefully worded to avoid the indication of demanded response on the part of the students. Any pressure applied to the students to complete work assignments created passive hostility and misbehavior, The investigator reported varying degrees of student success in the different units.

The purpose of Glenn's (1966) doctoral study was to determine whether or not educable mentally retarded students could learn to type, and if they could, whether or not the typewriter was an effective vocational and/or language arts tool. Twenty-two educable mentally retarded students were divided randomly into experimental and control groups each containing 11 students. The experimental group received typing instruction over the period of one academic year consisting of 40 weeks, while the control group received no instruction in typing. To test the effectiveness of typewriting as a language arts tool, four areas were investigated: spelling, handwriting legibility, handwriting speed, and composition quality. Glenn found that every one of the 11 students in the experimental group mastered the touch system. None of the students were able to achieve vocational capability. The spelling achievement improvement of the experimental group was significantly greater than the control group in each of the areas measured—the effect of typewriting upon transfer, retention, retention and transfer, and the effect of additional practice upon spelling after a time lapse. The handwriting speed of the experimental group improved by 3.8 words per

minute, while that of the control group improved 1.4 words per minute. The errors in handwriting made by the experimental group decreased 3.5 words per three minutes while the control group errors remained approximately stable. There was no appreciable improvement in the legibility of handwriting in either group as rated by a panel of four judges. The same panel of four judges rated the compositions of each group to determine the improvement in composition. The comparison showed that the experimental group's improvement was significantly greater than that of the control group.

The purpose of a study completed by Harper (1968) was to determine if there were any differences existing between mentally handicapped subjects who continued in a work-study program until graduation and subjects who entered the work-study program but dropped out prior to graduation. The investigation included the time the subjects were attending the secondary school's special education program and the post-school period up to the time of the study. Characteristics that were analyzed and compared related to the subjects' in-school adjustment, post-school adjustment, and vocational success. Harper concluded that there was a difference between the continuing students and the dropouts in many in-school, post-school, and occupational-related characteristics. Most of the differences indicated that the dropouts demonstrated less desirable characteristics than the continuing students, although in some cases the difference was not statistically significant. There were no marked differences in parental background; both groups' parents showed similar educational, occupational, and social backgrounds. He added that the parents of the dropouts did not seem to have had an adequate and positive control over their children. The continuing students showed a marked superiority over the dropouts in their employability. The dropouts who were employed showed an inferior ability to get and hold a job, as well as having inferior job classifications as a group. The continuing students showed more ability to use the services available to help them locate and maintain employment. The dropouts were not inferior to the continuing students in work habits. There was no significant difference in the overall job ratings by the employers of the two groups. However, a significant difference was found between the small number of dropouts who were employed as compared to the large number of continuing students who were employed. The continuing students who graduated seemed to make more successful vocational adjustments and to have more highly developed social characteristics than did the dropouts.

Tatum (1967), in a rather comprehensive study, investigated the educational-vocational decisions of the 1965-1966 seniors and senior dropouts in the Colorado Springs public schools. The data were gathered by: 1) a general questionnaire of seniors and senior dropouts, 2) counselor interviews with seniors and senior dropouts, and 3) an instrument to determine how seniors made decisions. Various responses and response patterns were analyzed in order to identify variables related to the educational-vocational decision-making of the seniors and senior dropouts. While the findings of

Tatum are valuable, of even greater value to persons involved in the counseling and guidance of young people are the implications he presented for each of his findings. Persons interested in this area would find it of value to review this study further.

Some findings of a study (Quinn, 1967) of the curriculum offerings for the slow learner in business education departments of the public high schools in Madison County, Illinois, were:

1. Criteria other than IQ are necessary to identify the slow learner.
2. Scholastic record, English grades, and reading test grades rank high among criteria used by teachers.
3. Fifty percent of the students enrolled in business arithmetic, retailing, advanced business, consumer economics, and business mathematics are classified as slow learners.
4. Aptitude tests are desirable prerequisites for shorthand, clerical practice, and distributive education.

Schultheis (1966) analyzed the ability of slow learners to develop the competence essential to the performance of the duties and responsibilities of recordkeeping positions. He also provided information useful in educating slow learners for and placing slow learners in office positions appropriate to their capacities. He reported that slow learners appeared to have the greatest employment potential in cash, invoice, account, and inventory clerk positions and least employment potential in the payroll and cost clerk positions. He concluded that the belief, held by some business educators, that slow learners are potentially employable in recordkeeping positions was only partially supported by the findings of this study. Slow learners appear to have employment potential in about one-third of the positions studied, and this employment potential is largely of a marginal nature. Only about one twenty-fifth of the positions studied included only tasks considered well within the potential capacities of slow learners to perform. Thus, the potential employability of slow learners in recordkeeping positions appears to be limited and largely of a marginal nature. Schultheis recommended that if the nature of recordkeeping positions studied is representative of the nature of recordkeeping positions in general, encouraging slow learners to pursue careers in recordkeeping occupations or placing slow learners in recordkeeping positions should be done with considerable caution. He added that a program of studies designed to provide slow learners with the general office skills, knowledge, experiences, and attitudes necessary for initial employment in general office positions would appear to be more justifiable than the preparation of slow learners for specific recordkeeping jobs.

Lightener (1966), in an analysis and evaluation of recordkeeping courses in the business curriculum of public secondary schools, surveyed: 1) randomly selected public secondary schools, 2) 30 selected business education leaders for their opinions regarding the recordkeeping course, and 3) 223 high school students who had taken recordkeeping at a selected high school. She reported that business education leaders believe the basic

purpose of recordkeeping should be to train the low ability student for office employment at his level of comprehension. She added that little agreement exists between teachers of recordkeeping and business education leaders in regard to the main objectives of the course, the placement of the course, student selection, the duration of recordkeeping, and an evaluation of the course.

Newton (1968) studied physically handicapped students enrolled in beginning typewriting classes. She found that the majority of the typewriting teachers who responded to a questionnaire believed that physically handicapped students should be included in the typewriting class with regular students. However, only a little better than one-half of the guidance counselors and three-fourth of the business teachers encouraged physically handicapped students to enroll in typewriting. Sixty-four percent of the teachers were of the opinion that physically handicapped students would have trouble adjusting to a skills course such as typewriting. The physical handicaps most frequently reported by the typewriting teachers were missing finger or fingers, one arm, deformed finger or fingers, and deformed hands. She added that the majority of the teachers who responded to the survey did not use any special methods, procedures, or equipment to teach the physically handicapped students in typewriting. Also, the majority of the typewriting teachers felt that the results obtained by the physically handicapped students in beginning typewriting were about equal to results obtained by the other students in typewriting. She concluded that the attitude of the student, the degree of the physical handicap, and the acceptance of the physical handicap by the student seemed to be the deciding factors in relation to the speed, accuracy, and grades attained.

Bernstein (1968) examined the effect of participation in a cooperative education program on the measured work values and the inferred work values of a group of disadvantaged twelfth-grade boys. Another purpose of Bernstein's study was to determine how changes in work values related to changes in academic achievement, job performance, and personal adjustment. He reported that for the most part there was little evidence of any work value differences between the co-op and the control students. Correlations between work values and academic achievement, personal adjustment, and job performance were generally low.

Dye (1968) investigated the office work perceptions held by tenth-grade female students enrolled in urban high schools serving disadvantaged youth. He then compared these perceptions with those held by tenth-grade female students enrolled in urban high schools serving advantaged youth and with those held by beginning female workers in office occupations. When comparisons were made on an individual city (eight cities) basis, he found significant differences within some cities. When the total scores were compared for all groups of tenth-grade female students enrolled in urban high schools serving disadvantaged youth, there were significant differences among their office work perceptions. However, when the total scores were compared for all groups of beginning female workers in office occupations, there was no significant difference among their office work perceptions.

The purpose of a study by Curtis (1968) was to determine if there were any differences between the vocational aspiration levels (as measured by Edwards' social-economic classification of occupations) and types of vocations aspired to by Negro students attending segregated high schools and those aspired to by Negro students attending desegregated high schools.

Based on his findings, Curtis drew the following conclusions:

1. Desegregated and segregated Negro students do not differ significantly in the socioeconomic level of occupation they chose. Nor do they differ in socioeconomic level when compared by primary vocational interest choice, reality vocational choice, and the reality vocational choice selected for them by their counselor.
2. The vocational aspirations of desegregated Negro students differ significantly from those of segregated Negro students with respect to types of jobs chosen. Desegregated students choose jobs that are in the professional, technical, managerial, clerical, and sales occupations. Segregated students choose jobs that are among the service, machine trades, bench work, and structural occupations.
3. There is a correspondence between the reality vocational choice of students and their counselors with respect to types of jobs chosen, with the exeption that fewer counselors choose the professional, technical, and managerial occupations.

Harris (1968) used a questionnaire to determine if substantial differences exist in the business education programs operated under a dual educational system (Negro-Caucasian) in Virginia.

Important conclusions drawn by Harris:

1. On the basis of enrollment and differentiated business curriculums, there was no significant difference in the number of business teachers employed in the Caucasian schools as compared to the number of business teachers employed in the Negro schools.
2. There was little or no provision made for terminal courses in business education for the Negro schools. Consequently, the subjects that were offered were the conventional basic courses such as first-year typewriting, general business, and first-year shorthand.
3. The business subjects offered in the Negro schools did not follow any particular curriculum pattern; therefore, no specific emphasis was placed on teaching the personal and employment skills which enable students to obtain initial employment.
4. Equipment was a problem in all schools, but was of greater intensity in the Negro schools than in the Caucasian schools.
5. Based upon the objectives of the business education department of Negro schools, there appeared to be little coordination between the guidance programs and the business programs since the kinds of positions commonly obtained by Negro students were low-entry jobs such as general office clerk and clerk typist.

Hendrix (1968) investigated the qualities and abilities of selected Spanish-American (Mexican-American) graduates of Albuquerque High School who held office positions in business firms in Albuquerque, New Mexico. After an analysis of her findings, she recommended:

1. Spanish-American students should be made aware of the importance employers attach to effective speaking.
2. Business education teachers should implement more activities involving oral communications and training in oral communications for the Spanish-American student.
3. Training for the overall abilities needed by office employees should be stressed in advanced business education courses rather than very high speeds in skills.

FACILITIES AND SCHEDULING

Scheduling

Phi Chapter of Delta Pi Epsilon (1969) surveyed all of the public high schools in the Minneapolis-St. Paul metropolitan area in which business subjects were taught using modular scheduling at the time the study was conducted. The purpose of the survey was to obtain some indication of the effect of modular scheduling on certain business subjects. Teacher opinion as to the effectiveness of and desirability of using modular scheduling in the business curriculum varied from school to school, from subject to subject, and from teacher to teacher. Generally, the teachers seem to have accepted modular scheduling. However, in most cases, teachers indicated that high ability students benefited most from modular scheduling, while low ability students experienced more difficulty in adjusting than they might have had in the traditional classroom setting.

One of the purposes of a study done by Claar (1968) was to find out how the student in business education perceived the modularly scheduled program in relationship to other types of programs. Claar concluded that the majority of the business students approved of the modular scheduling programs. In most instances students indicated that modular scheduling in business education created a very favorable learning situation. Students indicated that they prefer this method over the traditional approach.

Steagall (1968) reviewed the literature and surveyed teachers and students in block-of-time programs in Ohio. The advantages of the block programs identified by Steagall were: 1) the block program provides time for instruction in depth and for intensive training; 2) the teacher is able to become better acquainted with the needs, interests, and abilities of students and to plan learning experiences to meet student needs; and 3) the teacher is better able to vary instruction to meet individual needs. Steagall also attempted to determine whether the students enrolled in a stenographic block-of-time program achieved higher competencies in the knowledge and

skills of stenography than the students enrolled in a conventional stenographic program. He found no difference between achievement of block and conventional students.

Sullivan (1968) compared the effectiveness of a daily 30-minute class period in beginning typewriting with the effectiveness of the traditional 50-minute class period in beginning typing. Comparisons among classes for proficiency and achievement were made on the basis of timed writings and a production test at the end of the semester. The data indicated that though the experimental class met for 30 minutes daily while the remaining beginning typewriting classes met for 50 minutes, there was comparable achievement between the classes. Sullivan, however, did not draw conclusive statements because of the many variables experienced by the experimental class.

Valencia (1968) compared the relative effects of three laboratory time arrangements, all associated with a similar type of large group instructional arrangement, on typewriting achievement (typewriting speed, accuracy, and production scores). Group one (fixed-time plan) attended three 24-minute laboratory sessions per week. Group two (partially-opened time plan) attended three 24-minute laboratory sessions per week, plus an optional 28-minute laboratory session. Group three (no fixed time pattern) had unrestricted laboratory attendance with respect to laboratory time availability. Valencia stated that no one of the three laboratory conditions was significantly superior to the others in speed, production, or accuracy achievement in beginning typewriting.

Facilities

In an effort to provide better facilities to small schools, Anderson (1968) investigated the characteristics and acceptance of a proposed mobile classroom equipped with business machines and data processing equipment to serve certain small high schools in Utah. He concluded that:

1. The project is worthwhile and can fulfill a need in the small high schools of Utah.
2. Small high schools should not take a back seat in improving their vocational education programs, but should obtain the best and most up-to-date facilities possible.
3. A mobile office education classroom may stimulate more students to enroll in office education classes and can improve the skills of students presently enrolled in programs.

Most data processing studies include some recommendations regarding equipment and facilities. Bangs and Hillestad (1968) reviewed some of the problems involved with a data processing curriculum, including acquisition of equipment, source of funds for equipment and supplies, sources of equipment, location of equipment, and maintenance of equipment. Both Wenner (1966) and Wood (1967) devote a portion of their discussions to equipment and facilities problems in data processing. These studies should be helpful to persons making decisions about data processing equipment and facilities.

Supply and Demand

The number of high school teachers of business and office education are expected to decrease approximately 30 percent during the next two years. However, the number of post-high school business teachers is expected to increase by about 40 percent in the same time period. State directors have projected that of the vocational programs, office-clerical practice, data processing, and stenographic-secretarial will have the greatest need for additional teachers (Hensel, 1967).

Evidence seems to indicate that at the present time the number of business teachers being prepared for the secondary school levels is more than adequate to meet the present demand (Cook and Lanham, 1969). However, the evidence is not so clear with respect to supply and demand relationship at the post-secondary school level. In fact, it is likely that a shortage may exist for business teachers at the two-year and four-year college level. One thing that is clear is the need for improved data on both national and local levels with respect to the future demand for teachers (*Teaching Opportunities for You,* 1968).

Business Teacher Preparation

Studies of the preparation of teachers in the area of economics indicate that business teachers, in terms of course hours completed in economics, are the best prepared of all teachers to teach economics (Dawson, 1969; Garman, 1969). However, some research findings (Garman, 1969) have raised doubts about the value of college economics courses in the preparation of teachers. For example, the findings of the Garman study suggest the following implications:

> first, since the prospective business education teachers correctly answered only sixty percent of the questions on the *Test of Economic Understandings* (1964) and their understandings did not differ from the economic literacy of a group of high school students who had completed a one-semester course in secondary level economics, one might question their preparedness to teach economics in the high schools after graduation; secondly, since no relationship existed between achievement and the economics test and the number of semester hours in economics courses or the number of economics courses, one might question the value of the traditional economics courses in preparing business teachers to effectively teach economics concepts to secondary school students (Garman, 1969).

Anderson (1967) surveyed and analyzed the type and amount of economic course content required of prospective business and social studies teachers enrolled at selected teacher training institutions in the United States.

Anderson reported a serious gap between recommended preparation in economics for business and social studies teachers (Joint Council on

Economic Education) and current requirements of institutions preparing teachers. Fifty-three point two percent of the social studies majors and 14.9 percent of the business education majors were not required to complete the minimum of six semester hours included in the Joint Council's recommendation. Very little consumer or applied economics is required of business and social studies majors. In the majority of the institutions that prepare teachers, prospective business and social studies education majors did not complete a significant number of hours of economics in addition to those required.

Pollock (1967) obtained severity rankings of 50 prevalent problems encountered by general business teachers. Because of their implications for teacher preparation in the basic business area, the findings follow:

1. "Dumping ground" situation was the problem evaluated as extreme by the greatest number of teachers.
2. A wide range of student abilities was the problem evaluated as moderate by the greatest number of teachers.
3. Evaluating students fairly was the problem felt as slight by the greatest number of teachers.
4. Teachers' lack of business work experience was the problem evaluated as nil by the greatest number of teachers.
5. The category of problems relating to motivation and individual differences elicited more extreme and moderate responses than any other problem category.
6. The most beneficial courses in preparation for teaching general business were those in the areas of economics.
7. The course most needed for teaching general business, but not taken, was insurance.

Kinzey (1966) analyzed undergraduate curricula for preparing business teachers and evaluated the attitudes of a selected group of in-service secondary business teachers toward the value received from the curricula. Some of the conclusions reached by Kinzey were:

1. A very close relationship existed between the courses taught by the teachers and those required by the institutions.
2. The teachers felt best prepared to teach typewriting, shorthand, bookkeeping, and office practice.
3. Adolescent psychology, educational psychology, secondary education, and all of the special professional courses were considered to be highly valuable.
4. The teachers generally rated college courses of a vocational nature to be of highest value.
5. The teachers indicated a need for more courses in methods, office machines, data processing, and business content.
6. Classroom management and discipline, testing and evaluation, handling different ability levels, and motivation presented the greatest difficulties to the beginning teachers.

McCullough (1966) surveyed the opinions held by beginning high school business teachers regarding their college preparation for teaching. She reported the following findings:

1. In general, the beginning teachers rated their general education as adequate or better.
2. In regard to specialized education, at least two-thrids of the respondents indicated that a course in data processing should be required and that greater depth of subject matter in business would be helpful. The respondents were almost unanimous in the opinion that the skill subjects should be included in the curriculum of colleges and universities which have business teacher education programs.
3. In regard to professional education, more than two-thirds thought:

a. Student teaching was a very valuable aspect of their preparation.
b. Additional time should be spent in observing.
c. Student teachers should take few, if any, courses while teaching.
d. There should be weekly, or biweekly conferences with the college coordinator and frequent seminars with other student teachers.
e. Student teachers should teach both a basic business and a skill subject.
f. Methods courses need to stress the practical aspects of teaching.
g. The college coordinator of student teaching should be a specialist in business education.
h. The supervising teacher should not be in the classroom at all times.

McEwin (1968) tried to determine if there was a significant difference in the change in attitudes of students while enrolled in methods courses and student teaching, and if significant differences were found, to locate selected factors which were the most influential in bringing about changes in attitudes. The population of the study consisted of all students enrolled in methods courses and student teaching during the spring semester at East Texas University. Attitudes were measured three times by the *Minnesota Teacher Attitude Inventory (MTAI):* at the beginning of the spring semester, at the end of methods courses and beginning of student teaching, and at the end of student teaching. A questionnaire designed to reveal the relationship of selected factors to attitudinal change was administered at the time of the third *MTAI* testing.

McEwin concluded that there was a significant difference in attitudinal change among the following groups during methods courses and student teaching: Entire group (total population); Secondary; Elementary; Male; Female; Males in secondary education; Females in secondary education; Females in elementary education. Factors relating to professional relationships seem to be more influential than other factors considered. The most influential factor considered in the study was the personality of the cooperating teacher.

Cooley (1966) studied the question: "What is the role of the business education cooperating teacher as perceived by the teacher and student teacher?" He designed similar instruments for each of the two groups

participating in the study to elicit the perceptions of the two groups concerning selected cooperating teaching behaviors. He found, in general, marked similarities between cooperating teacher and student teacher perceptions of cooperating teacher behavior.

Cox (1967) examined the nature and quality of the student teaching experience and the contribution of the cooperating teacher to the student teaching internship in selected business teacher programs in Utah. She concluded that: 1) the student teaching internship is a valuable part of the preparation of business teachers; 2) spontaneous conversations and weekly formal conferences are the best and most often used means of cooperating teacher—student teacher communication; 3) it is best that complete or major responsibility be delegated to the student teacher for student discipline, evaluation of pupil achievement, grading of pupils, lesson preparation, and planning of classroom activities; and 4) it is desirable that cooperating teachers be present in the classroom most of the time during the first weeks of teaching.

Garman (1966) identified and classified the behaviors of business student teachers that college supervisors, cooperating teachers, and the student teachers themselves observed and reported as influencing pupil behavior or relations with others. Critical behaviors were gleaned from college supervisors' observation reports and from critical incidents reported by cooperating teachers and student teachers. The critical incident technique developed by Flanagan was used to determine critical requirements for effective business student teacher performance and to develop a classification system for observed business student teacher behaviors. The major areas identified were: preparation and planning, skill content and activities provided, direct instructional behavior, indirect instructional behavior, classroom management and control, and personal qualities. Garman reported that cooperating teachers and student teachers tend to report different proportions of effective behaviors for each of the six major areas of responsibility. Male and female student teachers tend to report different proportions of all behaviors for each of the six major areas of responsibility.

Ford and Patterson (1967) studied the most characteristic problems of student teachers in business education as viewed by student teachers, general supervisors, special supervisors, and cooperating teachers. The Q-technique was used in the study as a means of determining the most characteristic problems of student teachers in business education. The investigators reported the following findings:

1. General supervisors view the problems encountered by student teachers in business education differently than do student teachers, cooperating teachers, and special supervisors.
2. Motivation is the problem area of most concern to student teachers, cooperating teachers, and special supervisors.
3. The greatest agreement regarding the most characteristic problems of student teachers in business education exists between student teachers and cooperating teachers.

4. College supervisors and cooperating teachers indicated methods and techniques as a problem area of major concern, yet the student teachers indicated little concern with the area.

5. Student teachers indicated the problem area of assignments as one of great concern, yet the cooperating teachers and general supervisors did not indicate the area as one of concern.

Raby (1968) investigated the use of videotape recordings as an aid in the development of certain specific teaching competencies. Data were secured through an information blank mailed to 65 midwestern teacher education institutions and an instrument administered to student teachers and supervisors at the Laboratory School, College of Education, University of Missouri, Columbia. Based on these data, he concluded:

1. Videotape recordings of student teachers are used by relatively few of the teacher education institutions in the area served by the Mid-Continent Regional Educational Laboratory.

2. Among the institutions using videotape recordings, relatively few of the student teachers are provided the opportunity to be recorded.

3. The technique used at the evaluation session is not well developed.

4. The videotape recording of student teaching behavior and subsequent replay with analysis and evaluation are of considerable value in the development of the specified teaching competencies.

5. Teaching performance can be improved by the use of videotape recordings.

6. Evaluation of the student teaching process can be improved by the use of videotape recordings.

Daniel Brown (1968) investigated the effect of two training treatments, micro-teaching and skills of training presentations, upon selected teaching skills of business and distributive education interns. Interns were randomly assigned to treatment groups during methods course work. One group was trained via skills of teaching presentations; the other group was trained using micro-teaching, which included a practice of skills component. Both groups were pretested and post-tested for level of performance on six teaching skills. A panel of in-service business teachers rated the performance of the interns, both pre- and post-test, and rated each for level of performance on the selected teaching skills. Brown concluded that neither of the treatments produced a group mean gain for any of the teaching skills, of 1.0 from pre- to post-test. He added, however, that training through micro-teaching allowed interns in that group to achieve more statistically significant gains in teaching skills than did participation in the skills of training presentations process.

Since the passage of Federal legislation in 1963, an increasing amount of attention is being focused on the preparation of teachers for vocational business education.

Long (1967) used a questionnaire to obtain information from the 285 member colleges of the National Association for Business Teacher Education concerning their activities in business teacher preparation since the

enactment of the Vocational Education Act of 1963. Most of the respondents believed that the emphasis upon the vocational objective would cause office teacher education programs to have greater stature than before the enactment of the Act. Long concluded that the programs for the preparation of business and office education teachers and coordinators in special teaching programs need additional study and consideration. Fewer than 40 percent of the institutions replying offered programs for the preparation of teachers for adult education programs, technical schools, Manpower and Job Corps programs, private business schools, or for youth with special needs. No universal curriculum exists for the preparation of business and office education teachers. There is, however, a consensus among teacher educators that a course in principles or philosophy of vocational education, cooperative office education, and work experiences should be required.

Pierce (1968) determined the degree of impact the Vocational Education Act of 1963 had on business education in the public secondary schools of Missouri and the implications this impact has for the institutions preparing teachers for Missouri. Some of the conclusions drawn by Pierce were:

1. The vocational business and office education area has been afforded equal status in the *Missouri State Plan for Vocational Education* with the older vocational programs in agriculture, home economics, and distributive education.
2. Vocational business and office instructional personnel have been motivated by certification requirements to obtain academic preparation in the form of professional vocational courses.
3. A larger percentage of the school districts in the state were offering vocational business and office courses after the passage of the Act than before the passage of the Act.
4. The majority of the certified vocational business and office teachers in Missouri received their most recent degree from an out-of-state institution. Insufficient instructional personnel are being trained by institutions within the state to meet the needs of the vocational business and office program in Missouri.

The purpose of a study done by Ellis (1968) was to determine what relationship, if any, related work experience has to the teaching success of beginning business teachers in the secondary schools based on supervisor ratings, student ratings, and personal ratings by the teachers. The results, reported by Ellis were:

1. Business teachers with related work experience were given significantly higher ratings by their immediate supervisors than were the business teachers without related work experience.
2. Business teachers with related work experience were not given significantly higher ratings by the students than were the business teachers without related work experience.
3. Ratings assigned by the supervisors and students to the business teachers with more than one year ($\bar{X}$=204 weeks) of related work experience

were not found to be significantly greater than the ratings assigned to the business teachers with one year or less ($\bar{X}$=35 weeks) of related work experience.

4. Of the business teachers with related work experience, 100 percent felt that their experience had had a positive effect on their teaching success, and 91.7 percent of the business teachers without related work experience felt that related work experience would have had a positive effect on their teaching success.

DeMarco (1968) reported that to the extent that the programs of instruction prepare students to meet the current business occupation entry requirements, the business education teachers who teach these subjects are adequately prepared. However, business teacher education programs for the great majority of business teachers who must teach to heterogeneous groups of students in public schools would be improved by special courses in methods and curriculum development which will help them provide for students with special needs.

ADMINISTRATION AND SUPERVISION

The authors of the *Review and Synthesis of Research in Business and Office Occupations Education* (Lanham and Trytten, 1966) indicated that: "Significant studies dealing specifically with questions of administration and/or supervision of business education have not appeared in recent literature." This is still, in general, the status of research in this area. Efforts are being made, however, to overcome this weakness.

The basic problem of a study completed by Williams (1968) was the isolation and definition of substantive content from which could be formulated certain understandings and concepts basic to sound administration and supervision of business education. The work was an exploratory attempt to develop conceptually certain aspects of administration and supervision with which all business educators should be familiar as they conduct daily school activities.

Dittman (1967) determined the supervisory role of high school business department chairmen. Data were gathered through mailed questionnaires.

Major findings reported by Dittman were:

1. The majority of the business department chairmen had primary or shared responsibility for the majority of tasks performed.
2. The chairmen used few of the techniques available to them.
3. Most business department chairmen indicated that professional competence and academic preparation were the most likely reasons for their appointment to the headship. Personal interest and seniority were also given as likely reasons.
4. The majority of business department chairmen were not given released time to perform their departmental responsibilities.
5. Business department chairmen had taken course work in the areas of administration, curriculum, pedagogy, and research.

A major effort made in the area of supervision and administration is Monograph 120, *Responsibilities of the Business Education Department Chairman* (1969). This monograph contains 12 chapters, each written by an active department chairman. It is probably the most complete work in this area since the textbook edited by Hansen and Liles (1965).

A very real weakness is the lack of written information concerning the administrative and supervisory responsibilities of state supervisors. James Smith (1965) investigated the critical requirements for an effective state consultant of business education as determined by analysis of critical incidents.

Some of the critical requirements, in rank order, reported by Smith were that the state consultant:

1. Assumes responsibility for interpretation of education legislation.
2. Maintains friendly relationships and performs duties in a professional manner.
3. Cooperates in evaluations and in recommendations for curriculum improvements.
4. Provides advice and assistance in establishing and maintaining Federal/state financially supported programs.
5. Adequately prepares for presentations and for answering questions after presentations.
6. Furnishes and/or suggests teaching aids and techniques.
7. Uses various opportunities to encourage layman's participation and to increase his interest in school programs.
8. Utilizes diplomacy while discussing personal characteristics and professional affairs with educators or laymen.
9. Actively sponsors youth organizations that supplement the classroom.

EVALUATION

General Curriculum Evaluation

Curriculum development and evaluation research indicates that recent studies have emphasized:

> a) the identification of content common to clusters of occupations and to all kinds of work, b) the development of curriculums for students with special needs, c) the adaptation of curriculums to changes in educational approaches and technology, d) the identification of curriculum changes required by technological development, and e) attention to occupational areas that were previously overlooked or considered unworthy (Phipps and Evans, 1968).

A reliable method of objective program evaluation is not yet available. Until rather specific projected outcomes of instruction are available, it will be necessary to depend upon subjective judgment as the means of measuring the educational process.

Various exploratory and "new" attempts at evaluation include cost-benefit analysis and national assessment. Each is different in its approach.

The application of the cost-benefit analysis concept to education was developed in the 1960's. The "research on the economic impact of education has been directed primarily at determining: a) the effects of educational investments on growth of the economy or of a specific sector of the economy, such as agriculture or manufacturing; and b) the rates of return, both private and social, to alternative levels of schooling" (Coster and Ihnen, 1968). Those wishing to learn more about the cost-effectiveness approach to educational evaluation as well as other emerging approaches should read Chapter 7 of the *National Business Education Yearbook* (Wall and Materson, 1969).

Also, in the early 1960's, considerable discussion ensued relative to the need for better and more comprehensive information about the problems and progress of education in the United States. From these discussions, an Exploratory Committee on Assessing the Progress of Education was created. For the initial assessment, 10 subject areas were designated: reading, writing, mathematics, science, social studies, art, literature, music, citizenship, and vocational education.

The identification of objectives for each of the 10 areas was the next step, since the instruments for assessment were to be based on educational objectives. Three types of objectives were included: 1) objectives that scholars in the field considered authentic to the discipline, 2) objectives that the schools said they were attempting to achieve, and 3) objectives that lay people in the country felt were important for American youth to achieve (Merwin, 1969).

After the objectives were identified by scholars and teachers, they were reviewed by panels of laymen from throughout the country. Exercises were developed to assess the extent to which the objectives were being achieved. During the review of the exercises by subject matter specialists, serious problems were identified in developing instruments to assess vocational education. "There had been earlier indications of difficulties of consensus within the field both among professionals and laymen.... In these groups there was great disparity in view of just what constituted 'vocational education'...." (Merwin, 1969). After several additional meetings with specialists in the general field of vocational education it was finally decided that the problem was with the "great ambiguity surrounding the term 'vocational education' and it was recommended that a more definitive term which could be used would be 'Career and Occupational Development'...." (Merwin, 1969).

Developmental work for a national assessment program of the type envisioned by the Exploratory Committee can never end.

> Continued adjustments will need to be made in instrumentation to reflect objectives that change over the years. Much as factors involved in the gross national product (GNP) have been altered over the years, educational factors contributing to the description of the progress of education will need to be altered as progress is made. A

> second factor that necessitates continued development is the use of exercises in reporting. As exercises are revealed in national assessment reports, they cease to be useful as part of an ongoing program. Thus new exercises to tap ongoing objectives and new exercises to tap new objectives will be needed at each cycling of a subject field (Merwin and Womer, 1969).

The responsibility for the National Assessment program was assumed by a new organization know as Education Commission of the States (ECS) (Educational Researcher, 1969). ECS is a non-profit organization with a membership consisting of governors, chief state school officers, legislators, and others concerned about education.

Those readers interested in pursuing further the subject of educational evaluation are advised to read the 1969 Yearbook of The National Society for the Study of Education entitled *Educational Evaluation: New Roles, New Means.*

Business Program Evaluation

The 1969 *National Business Education Yearbook* (Huffman, 1969) is devoted to criteria for evaluating business and office education. The first 10 chapters of the Yearbook deal with the present status of program evaluation at the high school, junior college, vocational-technical institute, proprietary business school, and teacher education institution levels. Chapters 24, 25, 26, and 29, devoted to "A Taxonomy of Office Activities for Business and Office Education," will be helpful to those in business education who are concerned with the preparation of behavioral objectives.

Byrnside (1969) has contributed the following principles of evaluation for business and office education:

1. Evaluation should be made in terms of the objectives of the program.
2. Evaluation should include economic factors as well as educational objectives.
3. Evaluation should include an appraisal of both student outcomes and the educational establishment.
4. Evaluation should be conducted on the basis of what should have been accomplished as well as what has been accomplished.
5. Evaluation should be a continuous process.
6. Evaluation should be integrated and interpreted into a portrait.

A rather intensive study (Kaufman, Schaefer, *et al.,* 1967) of vocational programs in nine communities answered these questions:

1. Do graduates really use the training they receive in school?
2. How effective is this training?
3. Does it really prepare for the types of jobs young people obtain upon graduation?
4. Should training be conducted in a comprehensive or separate vocational high school?

In all, 25 schools were visited and evaluated, 1,600 questionnaires were completed by teachers, and 658 employers and 5,181 high school graduates were interviewed.

Some of the highlights of the findings relating to business education were:

1. With the exception of one school, the aims and objectives of the business programs were solid and well-conceived.
2. Placement data revealed that graduates of business education were placed in the occupation for which they were prepared.
3. There was evidence of closer relationships between office occupations teachers and guidance counselors than in other vocational areas.
4. In most schools, placement and student follow-up were being handled by the head of the business department.
5. The head of the business department has established and maintained contacts both with employers and the local employment service.
6. In all communities, the office occupations programs were rated "good" or "excellent." There was little wrong with the office occupations program that additional financial support could not cure.
7. One of the major strengths of the office occupations programs was their flexibility. Students with a wide range of ability and interests were able to participate successfully in the programs and receive vocational skill training. The schools were providing a vital service to the entire community in this respect.
8. Two deficiencies of most of the business education programs were identified: 1) lack of part-time cooperative work experience programs, and 2) little use made of advisory committees in two-thirds of the schools visited.

Business Teacher Evaluation

In a discussion on the evaluation of teachers in Monograph 120 (Murphy and Maxey, 1969), the following conclusions concerning evaluation of instruction in business education were listed:

1. For quality education, a continuous evaluation of the teaching process is mandatory.
2. Evaluation is the cooperative responsibility of all concerned in the educational process.
3. Behavioral changes should be in the direction of objectives decided upon by the administration and staff.
4. Cooperative evaluation involves intelligent selection and use of techniques to gain evidence of behavioral changes.

In one study (McLeRoy, 1968), department chairmen rated each of their typewriting and shorthand teachers as exceptionally high, above average, average, below average, or very poor on 10 criteria. Department chairmen rated the following teachers consistently higher than others: 1) teachers with masters degrees, 2) teachers actively taking graduate work, 3) teachers

holding professional membership, 4) teachers who teach both typewriting and shorthand, and 5) teachers who rarely use time in class to correct papers.

Straight-Copy Typewriting Evaluation

West and McLean (1968), in a discussion on scoring of straight copy timed writing, stated:

> In the light of present knowledge about straight-copy performances—from the data on the 495 typists of the present inquiry and from data on thousands of cases in dozens of studies over many years—there is currently no option except to score separately for gross speed and total errors.

RESEARCH

As was reported by Lanham and Trytten (1966), "The future for research in business education is most encouraging." This statement is even more applicable in 1969. Business educators are becoming more sophisticated in the area of research design than was true of the 1950's and early 1960's.

General Trends

Dwight Allen (1969) pleads for new techniques and new arenas for educational research. "We have frequently been attacked by outsiders for dealing with trivial matters in our research and for failing to deal with the socially significant issues of our times. And, almost always, we have reacted defensively citing the need for 'pure' or 'basic' research, mourning the complexity of the big and important problems, demanding more time to build the basic tools and models for researching the more difficult problems."

Professor Allen (1969) offers several positive approaches to educational research which, in general, are accepted by business educators. Some of these proposals are:

1. There *are* important issues in and related to education that we have not been investigating and that we should be looking at. We know next to nothing about the relationship between teachers' attitudes, personality characteristics, and behavior. We have hardly touched on the relationship between teacher behaviors and learning in students.
2. We are growing into an age which voices more and more concern for the well-being of individual human beings, and yet we continue to use old statistical models which negate individual differences rather than developing new models which might teach us something about them.
3. There are difficult and complicated problems that are hard to ap-

proach but represent crucial issues in education. They are problems whose social significance demands attention even if statistically significant results will be hard to achieve.

4. There are, of course, other reasons for the neglect of research in socially significant areas. Most import, perhaps, is the fact that much of the research already completed in education is so consistently ignored in school practice.

The above four points are not only applicable to the broad field of education, but are also applicable for business education.

Research Method

In a report "Selecting and Developing a Research Problem" (1967), the intent was to "describe the research process in the hope that it will stimulate the conduct of research. . .and/or permit a more intelligent assessment and subsequent application of the research of others to classroom/laboratory situations." This is a laudable objective; however, the report emphasizes almost entirely how to conduct a research study.

For example, the following well-known steps are suggested:

1. Selection of a Resource Problem Area
2. Review of the Literature
3. Definition and Statement of the Researchable Problem
4. Deducing Objectives
5. Research Design
6. Summary

For the person looking for a concise statement of the research process, "Selecting and Developing a Research Problem" (1967) will be very helpful.

Research in Business Education

It is the opinion of the reviewers that research in business education is making steady progress in the improvement of the quality of research. As one example of this new sophistication, the National Business Education Association Research Foundation in 1968 sponsored a research institute that emphasized the improvement of research competencies in business education. The titles of papers presented at the institute indicate the direction of the progress: "Product or Systems Research as Applied to Education for Business," "Controlled Experimentation Applied to Education for Business," "New Data Analysis Techniques and Their Implications for Research Design in Business Education" (Building Research Competencies in Business Education, 1969).

It is obvious that business educators are making a substantial contribution to the quality of research in business education. Increased competencies and increased quality in research are evident when the research of yesterday is compared with the research of today. However, as Allen (1969) points out, attention should be given to ways and means of researching new problems and issues. This is the challenge of the future.

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